The Builder.

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"Polyhymnia": From a Life-size Cartoon.....By Miss Margaret I. Dovaston.
(*Royal Academy Silver Medal*, 1907.)

Design for a College Chapel (*Royal Academy Gold Medal and Travelling Studentship*, 1907) .....By Mr W. Harvey.

1. Perspective View.
2. Side Elevation and Section.
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Ecclesiastical Goldsmith's Work in the Coast Towns of Istria and Dalmatia.—II.

IN the ancient cathedral, Arbe, is an interesting reliquary (Fig. 5) containing a crowned skull said to be that of S. Christopher. The head was there in the time of Bishop Dobrana (1080-86), who brought it forth to deliver Arbe from a horde which was attacking it, with the happiest effect. The reliefs upon the shrine are gilded upon a ground of silver. The work appears to be of the XIIth century, and is based on the antique, but with some Byzantine influence. The reliquary is rectangular with pyramidal cover, and the subjects upon the four sides are:—1. A seated king and an archer shooting at S. Christopher, who is bound to a stake; the arrows fall deflected by the hand of God appearing by S. Christopher's head. A canopy supported on twisted columns is above the subject. 2. The saint is beheaded beneath a canopy; the hand of God again appears above the headless trunk. Two soldiers in Roman costume stand, one with lance, and the other with raised sword. 3. Three holy men holding scrolls, barefoot and robed in tunic and toga. 4. Three holy women; two hold a cross; the heads have been restored. All these figures have large heads, especially the standing figures of men and women under the round-arched arcade with alternate twisted and ringed colonettes. The lid has *repoussé* subjects upon the four surfaces:—1. Christ enthroned, blessing and holding a book, with the monograms I C and X C; in the corners the lion and eagle with books. 2. S. John with eagle and monogram I O N S. 3. S. Christopher, beardless, as a standard bearer, and with a royal mantle, with inscription S. X P O / F O R / V S; at his feet a male and a female figure—donors probably. 4. The Virgin standing, with monograms M H Θ Y. An angel with a book stands near. The skull has a double crown, the outer of gold set with precious stones, the inner of silver ornamented with lilies. The reliquary was given by Queen Elizabeth of Hungary, according to tradition. There are also three strips of champlevé enamel from a destroyed reliquary, with figures of eight of the apostles—Matthew, James, Bartholomew, Andrew, Thomas, Philip, Thaddeus, and Svhon (Simon)—seated and holding symbols in one hand and churches in the other (which have central domes sometimes and pediments over the doors, while the roofs of the towers look much later than the XIIIth century, to which they are generally ascribed). The colours used are blue, green, yellow, white, red, and the style resembles that of the Maestricht school. Eitelberger describes another plaque on which SS. Peter, John, Mark, and three

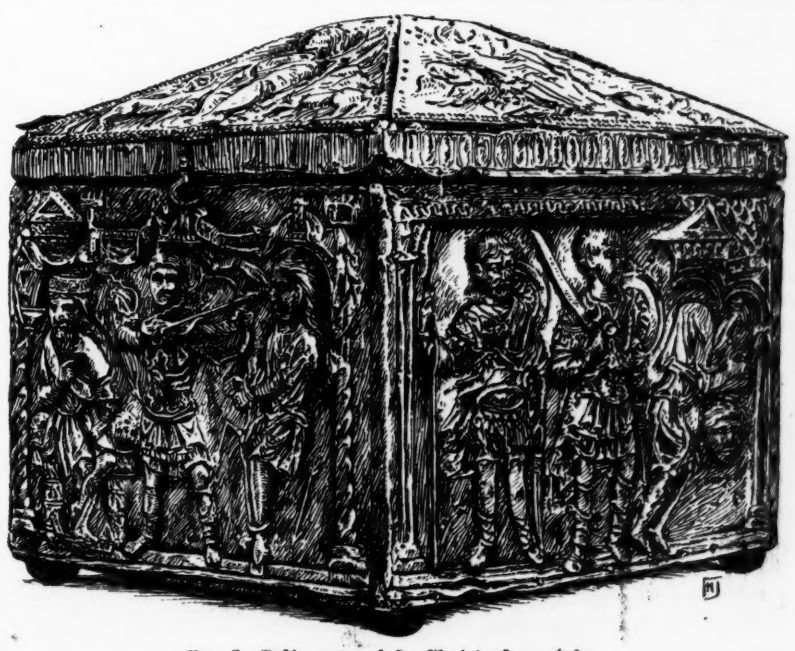

Fig. 5. Reliquary of S. Christopher, Arbe.

others were represented. This seems to have disappeared since his time, since it was not shown me with the others.

In the treasury of the cathedral, Spalato, are several interesting crosses of the VIth to IXth centuries, some of wood, covered with metal, and enriched with gems, which were benedictional crosses, and some, *encolpia*, of gilded bronze with figures in relief or incised. The inscriptions and character of several of these make it probable that they are Syro-Egyptian, and there is one of rock-crystal, upon which the name of the owner is inscribed in Coptic letters. Two MSS. of the XIIIth century have silver covers with figures incised upon them, and gilded. On one side of one is Christ enthroned on the rainbow within a vesica with the usual monograms, and the emblems of the four Evangelists named in Gothic letters in the corners. On the other side are the Virgin and Child enthroned, with roundels of the archangels Michael and Gabriel. Their names are in a line above the figures. The other has on the front Our Lord enthroned within a guilloched *mandorla* inscribed IHS IPC, and the symbols of the Evangelists larger in the corners; on the back is the Crucifixion, with the feet separate and two angels above the arms of the cross. They have both been restored in the XVIIth century, and the framing slips bear patterns of that date. There are eight chalices of the XIVth or XVth century damaged by ignorant reparations. Two are decorated with nielli in medallions and in rectangular shapes and with well-designed foliage scrolls; a morse of the same date (Fig. 6)

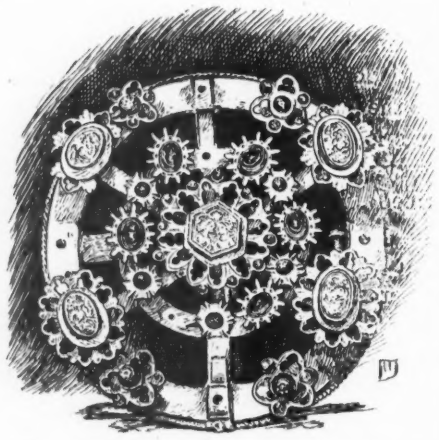

Fig. 6. XIVth Century Morse, Spalato.

has nielli, precious stones, and pierced work. Two arm reliquaries of S. Doimo are lavishly set with gems and decorated with filigree, the fingers being crowded with rings, and there is a head of S. Vincent of early XIVth century work on a later base, and a finer head of S. Giovanni Elemosinario. The later work includes an early XVIth century Ostensory, a little chapel borne by two angels, decorated with enamel, and very pleasing in design. It bears the inscription:—"MDXXXII. Victor de Angelis fecit Venetiis sumptibus d(ominæ) Chat(erinæ) uxoris q(uondam) d(omini) Zarch(i) Drasoevic." A ciborium of the XVIIth century is also to be noted.

The treasury of the cathedral, Ragusa, is particularly rich in reliquaries, of

Fig. 7. Reliquary of S. Blasius, Ragusa.

which the most valued contains the head of S. Blaise (Fig. 7). It consists of a number of small Byzantine enamels reset in an elaborate floral pattern of filigree and enamel by a Venetian goldsmith in 1694. The design resembles the later Hungarian enamelwork very closely. The stalks are simply gold threads, and the leaves, flowers, etc., are filled in with enamels of different colours, leaving the copper ground showing, each plaque being surrounded with a twist of gold and pinned down to the capsule of the skull. Legend says that the head was brought to Ragusa in 1026, but even the Byzantine enamels scarcely look as old as that, and the occurrence of two half-lengths of S. Blaise and two of S. Peter suggests that it was made up with fragments of several reliquaries, of which other portions have been used in the arm reliquary of S. Blaise. The names appear to have been added in the XIIIth century, the letters are Latin. There are three rows of the enamels; at the top, upon the curve are four figures in roundels—SS. Andreas, Blasivs, Petrvs, and the archangel Michael. The nimbi are blue-green, the figures red. The second row has eight enamels alternately round and square, the round ones being unnamed. They are a saint with a stole holding a cross in the right hand, and two others, and a badly-restored Madonna. The names on the square enamels have been added later, they are an apostle with a roll, Santvs Petrvs; a bishop, Santvs Blasivs; Santvs Matevs with a book in the left hand; Santvs Jacobvs with a roll. The third row has eight circular enamels alternately figures and ornament. The figures are—Christ enthroned, blessing with the right hand and with a roll in the left, inscribed IC XC; S. John Baptist with inscription, S IO BAPT; S. Zenobius, with name in full, and S. John the Evangelist, S. Johes E b A Gelisa. The arm reliquary is inscribed "Tomaso Paleologo despota del Peloponeso donato a Giorgio Radovanovich civi Raguseo 1452." The saints who appear on the enamels are SS. Laurence, Andrew, Nereus, Achilleus, Lucas, Tomas, Simon, Bartholomew, and Paul. Another reliquary has remains of enamel plaques of Christ, the Virgin, Simeon, SS. John the Evangelist, Blaise, and John Baptist. A hand of S. Blaise in a beautiful filigree reliquary is kept under glass. A head reliquary has a fine pierced pattern of early Renaissance character with niello medallions of the Evangelists' symbols. Another not quite so good (Fig. 8) is dated 1349, and has similar niellos with interlacings of oak. There are several very curious thorax reliquaries, and many arms; two portable altars with inlaid reliquaries in patriarchal crosses were seen by Eitelberger, with fine figure subjects; on one the Virgin and S. John Romanesque repoussé, and Christ on the Cross in the other, with the monograms added in enamel. Another cross, with reliefs of the Virgin and Child with angels at the top, S. Mary Magdalene below, and SS. Blaise and Vincent on the arms, encloses what the Canon told us with pride was the largest piece of the true Cross in existence. A processional cross of the XIVth century, set upon an XVIIIth century stem, bears figures in relief of Christ and the Evangelists' symbols gilt on a silver ground. On the back are the Madonna and Child, with God the Father above and a cherub beneath, SS. Biagio and Francis. Most of the objects are either of the XIVth or late XIIIth century in style, but may very likely be later, the goldsmiths still using the patterns of an earlier period. The curious reliquary (Fig. 9) supporting the jaw of S. Stephen of Hungary, and with a figure of the monarch hanging below it, is interesting (as well as unusual) as being an example of ancient Hungarian silversmith's work. It was brought to Ragusa for safety during the Turkish period.

In S. Domenico is the cross of the Servian King, Uros, a not very interesting silver cross of archiepiscopal shape, parcel gilt, with piercings at the crossings and rosettes at the end of the arms, perhaps added in 1548, when it was restored. It is kept above an altar in a room within the sacristy with double-locked door. The treasury also contains several chalies, a Gothic monstrance, and

Fig. 8. *Skull Reliquary, Ragusa.*

several reliquaries. Above the high altar of the Church of S. Biagio is the figure of S. Blaise, the patron saint of the city, in a glass case. It was saved from the fire of 1706 which destroyed the ancient church. It is made of silver plates, gilded, on a wood basis, and shows the front part of an old man with a long beard in episcopal robes, holding a model of the city. The back portion has never been completed. The head is too large, the neck too short, and the arms too long. The chasuble has an embroidered cross with figures of Christ and three saints or apostles, with two little angels censing on the arms. Two half-length saints are on the dalmatic beneath a double arch. The draperies are well treated, the stuff showing an elaborate Burgundian pattern. The town shows details which prove that it was made between 1480 and 1485. It has been restored at several periods. The silver of the cast portions is different in colour from that of the beaten parts.

The treasury of the cathedral, Cattaro, contains many rather uninteresting objects, such as an arm and leg reliquaries of the XIVth century, or, rather, later decorated with nielli and bosses in relief, and a few others shaped like vases borne on stems; on some of them the date (1483) can be traced. The reliquary of the body of S. Trifone (Fig. 10) is of silver and rather rough XVIth work, but encloses a wooden coffer, upon which remains of IXth century painting have been discovered. The head reliquary is of gold and enamel; the stem and an arcade round the upper part of XIVth century work, the upper portion remade in the XVIIth, and the foot apparently intermediate, with early Renaissance details upon a Gothic plan, medallions in relief and rough scroll-work. The knop has eight roundels with niello crosses crossletted; on the stem are saints in niello in vesicas. The arches of the canopied arcade are filled with figures in relief in couples, and enamels in *baisse-taille* red and blue alternately. The nielli have had a ground of blue enamel. These two reliquaries and a crystal cross in a very graceful setting, early Renaissance in style, are kept in a receptacle lined with cut velvet, upon which are embroideries of half-figures of saints beneath niches raised in gold; above the niches are domes, and between them twisted columns; probably originally part of a vestment. A globe-shaped ciborium with cresting and knop of the XIVth century is interesting. Upon the globe a pattern with beasts and leaves is chased; the foot is conical with little niello medallions and piercings on the perpendicular parts of two steps sexfoil in plan. The knop has pinnacles and pierced gables. A half-length figure of Christ in silver upon a XVIIth century pierced hemispherical base is well modelled and designed, and a reliquary cross, which was used to bless the army which relieved Vienna from the Turks in 1683, deserves mention, though it is of wood not silver. The fine retable is no longer behind the altar, nor did we see anything of it. The church was still undergoing a thorough restoration. Two other retables, which bear considerable resemblance to what it was, still exist—those at Veglia and Grado. At Veglia the retable or frontal is preserved under glass just within the west door upon the south

Fig. 9. *Reliquary of Jaw of S. Stephen of Hungary, Ragusa.*

wall. It is thought to have been a triptych originally. Each of the wings has ten figures in two rows, one above the other—twenty figures in all. On the right S. Peter occupies the middle of the top row with S. John Baptist below; on the left are S. Paul and S. Nicholas in the corresponding places. All the figures stand on brackets. The upper centre is occupied by the Madonna and Child, standing on the crescent moon; below is the Coronation of the Virgin; the other four niches have figures of angels, three

Fig. 10. *Reliquary of S. Trifone, Cattaro.*

half-lengths in each, one above the other. S. Jerome and S. George are recognisable among the other saints. The heads are much too large, and the figure work is coarse. The niches are trefoiled and ogee-headed, with crockets and finials and octagonal colonnettes between springing from corbels and crowned with scaly pinnacles; they have piercings resembling window tracery, with rosettes between each repetition. The bar which divides the two ranges of figures and the frame have a very beautiful triple row of vine scrolling in exceedingly low relief, which is quite lost at a little distance. An inscription gives the date of 1742 and the name of Peter Grimani, which must refer to a restoration, as the style suggests the XVth century. The altar frontal at Grado is inscribed "†MCCCLXII de Settembrio in lo tempo del nobele Miser Andrea Contarini Doxe di Vanesia e Miser Francesco Contarini Conte de' Grado fo fatta questa palla e Donado Macalorso da Vinesia me fece." It is of silver gilt 4 ft. 7 in. high and 7 ft. 4 in. long, with twenty-one divisions in three rows of seven panels containing medallion half-lengths of Greek saints, most of them earlier work used up afresh. In the upper row in the middle is a half-length Ecce Homo, right and left are the symbols of the Evangelists, and the outer corners have the Annunciation, the Virgin on the

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right and the Angel on the left. In the centre of the second row Christ sits blessing, with raised right hand, and holding an open book in the left. "Ego sum lux mundi qui in me crediderit non morietur in æternum Amen." On the right are SS. John, Paul, and Fortunatus; on the left, Felix, Peter, and Martha. In the lowest row the centre shows a chalice with the host, on the right SS. Hermagoras, Thecla, and Erasma, on the left Dorothea, Euphemia, and another Fortunatus. The treasury also contains a XIVth century casket and two Limoges *gemellions*, unique in the coast towns, as far as my knowledge goes. They are champlevé on copper, which shows traces of gilding on the backs, which are engraved. A central circle on the face contains a shield with a rampant lion enamelled in blue; round it is a quatrefoil made by four larger circles, which overlap at the re-entering angle. The spandril spaces are filled by dragonlike monsters on a green ground. The ring and the shield show metal. The quatrefoil is outlined with white and filled with scrolls and figures fighting with each other or with beasts. The corner-pieces have a little tower and scrolls, the windows and cornice are red enamel, the ground is green. The outside edge has a zigzag of

Fig. 11. *Monstrance, Ossero.*

blue enamel. The hole through which the water was poured over the hands has a spout of an animal's head.

At Parenzo is a fine early Renaissance frontal of silver gilt. Five shell-headed niches, separated by fluted pilasters with caps supporting an architrave and standing upon a continuous base, are tenanted by figures; in the centre the Virgin and Child, with two saints to each side, one of whom is a bishop, and another vested as a deacon. The mouldings are quite architecturally treated in low relief. The sides of the niches have a graceful flowing ornament; their bases and the frieze are covered with stamped diapers, the latter enriched with medallions in a square framing containing bust of the apostles, and the one doubtful portion of a very satisfactory design is the endeavour to obtain the appearance of greater relief by perspective in the treatment of the pilasters and niche forms.

There is a cast of the celebrated shrine of S. Simeone, Zara, in the Victoria and Albert Museum, on the lid of which the figure of the saint lies nearly lifesize. The subjects upon the panels refer to the history of the relics, and an inscription on the back gives the date of its making as 1380, the Queen of Hungary as the donor, and the goldsmith Franciscus as the artist. On the roof is a panel showing the artist at work upon it. It is supported by bronze angels in the church, with a stair leading up to a platform and down again, to allow of the osculation of the faithful. It is said that these angels were originally of silver, but were melted down at the time of the war between Venice and Cyprus, and then replaced by the present bronze ones. The whole shrine cost 70,000 ducats. To the right of the choir in a chapel just outside the sacristy is a retable of *repoussé* silver—two big angels kneeling below and God the Father above, a Madonna and Child with painted faces, and the rest of the figures in relief. The frame is flanked by a S. Michael and a saint, with a little angel flying below and holding a book, also with the heads only painted. These figures and the Virgin and Child have a good deal of gilding about them, and may be of the XVth century, since they look earlier than the rest, which is late XVIth or XVIIth. In the treasury is a late Gothic chalice with Renaissance additions made of silver, parcel gilt, with nielli and a little enamel; it has an octagonal knop with coats of arms reversed on quatrefoil ends and the sexfoil foot. Upon the base of the cup are subjects in outline, the Crucifixion and figures of saints within petal-like forms.

At S. Francesco, Zara, are four chalices of silver gilt of the XIVth and early XVth centuries. Two of them have elaborate knops with crocketed niches with figures, and one has the symbols of the Evangelists in high relief on the foot, with leaf scrolls and big stars, the plan being octofoil. The finest has a sexfoil foot, and in both these there are angular projections between the foils and a pierced perpendicular band below. Upon the foot are six roundels, with Christ and saints in low relief, as if for *baisse-taille* enamel. The third has a knop with window tracery, pinnacles, and flying buttresses, and on the foot, of a later date, graceful leaf arabesques rather Aldegrever-like.

At Ossero, on the island of Cherson, is an interesting late Gothic monstrance (Fig. 11) with many niches and figures, and scrollwork upon a blue enamel ground decorating the smooth curved surfaces. The architectural details are gilded; the rest is silver. In some places the enamel has come away, and there is no sign of pattern upon the silver beneath, only a general cross-hatching, showing

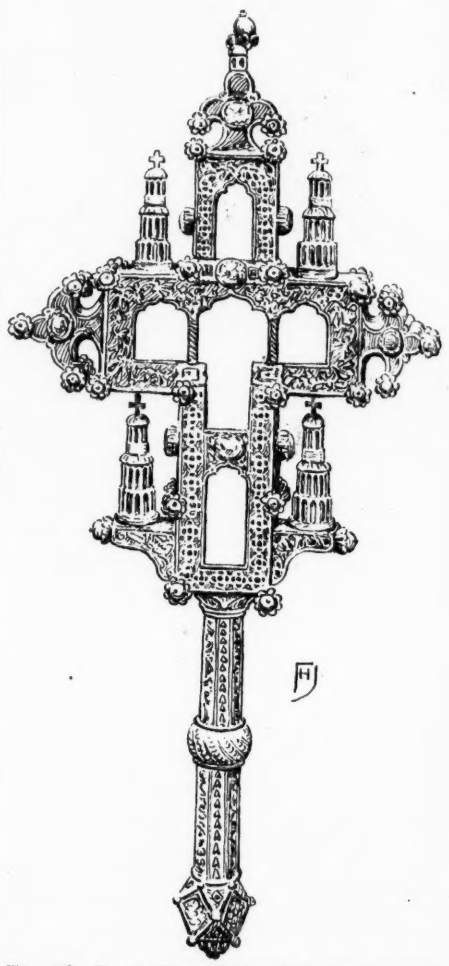

Fig. 12. *Greek Benedictional Cross, Parenzo.*

that the arabesques and other patterns were not soldered to the ground beneath, but only arranged with the enamel flux before firing. Below the knop the work is of the XVIIth century.

At Parenzo there is a very interesting Greek benedictional cross (Fig. 12), an exception to the general rule that the later work may be disregarded. It is of the same type as the bulk of the XVIIth century crosses at Kloster Savina in the Bocche di Cattaro, and consists of an enamelled case, pierced to allow of the subjects carved upon the wooden cross within to be seen. It is signed by "Ezekiel, monk of Laura"—no doubt of Mount Athos. The enamel colours used are green, two blues, a violet-grey, and red. On the upper side of each arm is a dome-cornered turret pierced with arcadings in two stories, and many pearls and precious stones enrich it. It is made to take to pieces. The subjects of the carvings are:—At the top, the Annunciation; in the centre, the Baptism of Christ with angels assisting; at each end, an Evangelist seated; below, Christ as Judge between two saints; at his feet, men in the abyss. On the back are the Presentation; in the centre, the Crucifixion, with the Virgin and holy women and two Evangelists seated in the arms; below, the Harrowing of Hell, or the Resurrection of the Dead. This cross used to be considered very ancient; it is now adjudged to the XIIIth to the XVth

century, but may be later since it resembles the crosses at Kloster Savina, which are known to be of the XVIIth century. It would be wrong to conclude without mentioning the ewer and dish in the treasury at Ragusa, covered with representations of sea creatures and weeds, worked with the most extraordinary realism and fineness, a monument of misplaced labour and ingenuity which excites the greatest admiration in the mind of the average tourist, to whom it is exhibited as a miracle of art. It is thought to be the work of a Nuremberg goldsmith from the stamped N upon it, but one would be glad to know that Albert Durer's city was innocent of its production.

THE DOME OF ST. PAUL'S.

NO form of architectural construction is more interesting or less generally understood than the dome. It is probably because of these facts that so many domes of all forms and sizes have been built in past ages and in the present day, and that the average architect is somewhat inclined to avoid a feature whose design and construction appears to involve considerable trouble and no small amount of anxiety.

The old masters who were gifted with intuitive perception to such an extent as to be able to do without precise scientific knowledge, have built domes of magnificent proportions which remain to this day. Nevertheless, those designers only understood in a general way the principles underlying dome construction. This is made clear by the fact that in such structures as the domes of Sta. Sophia, Sta. Maria del Fiore, and St. Peter's, cracks have developed at different times, and reinforcement has been necessary, particularly in the case of the dome of St. Peter's.

The dome of St. Paul's shares with the similar structure of the Pantheon the credit of being correct in design and construction. The more one inquires into the details of Wren's work the greater reason is there to wonder at the grasp possessed by that great master of the main truths underlying every kind of architectural and engineering construction with which he had to do. In the communication contributed by Mr. William Dunn to a recent number of the *Journal* of the Royal Institute of British Architects* our readers will find ample confirmation of the foregoing statement.

The author only considers in a general way the salient features of the dome, but he puts his meaning very clearly, and illustrates the description of constructive details which have not been generally known in the past by an excellent isometric view, partly in section. This drawing does not extend to the bottom of the inner conical dome, and obviously cannot show the whole of the construction. Therefore, in studying the paper by Mr. Dunn, readers will find it convenient to use as additional illustrations the general sections reproduced in the same number of the *Journal*.

Briefly defined, the outer dome of St. Paul's consists of a truncated cone covered at the top by a truncated spherical dome surmounted by a heavy lantern, and outside is a truncated spherical shell which the man in the street believes to be the real dome. As Mr. Dunn points out, a hollow cone is fairly stable when supporting uniform loads around its periphery, but is not at all a stable form of construction under loads concentrated at various points, such as are those represented by the weight of the massive lantern on the top of St. Paul's. Wren evidently recognised this point, and for the purpose of equalising the load upon the top edge of the cone he built the covering dome, upon which he placed radial sloping buttresses, transmitting the lantern loads to that stable structure. The transformed load was thus distributed uniformly over the entire ring of masonry at the top of the cone. This excellent arrangement is clearly shown by Mr. Dunn's isometric drawing, and constitutes one more proof of Wren's constructive genius.

Most of the old masters probably knew nothing, or, at any rate, very little about the joint of rupture in domed structures and the tensile ring stresses in all courses below that joint. We are not justified in saying the same of Wren, because, as illustrated by Mr. Dunn, the dome of St. Paul's is adequately reinforced by iron bands in the spherical dome cover and in the conical dome below.

In a dome open at the top, as in the covering dome of St. Paul's, special joints of rupture exist below the principal joint of rupture if the base of such a dome is continued beyond the latter joint. Whether Wren knew this we cannot say, but it is probable that he was well aware that radial thrust might be developed at more than one joint near the base of the spherical cover. To withstand thrust of the kind he built into the masonry three iron rings 4 in. wide by $1\frac{1}{4}$ in. thick at the levels approximately indicated by Mr. Dunn's drawing, and the absence of radial cracks has shown that the reinforcement has properly fulfilled its intended purpose.

Next, it should be pointed out that in a truncated conical dome, such as that supporting the weight of the lantern, buttresses, and spherical cover in St. Paul's, the successive courses of masonry may be subject to uniform radial pressure, causing either tensile or compressive stress or no stress at all, according to the batter of the sides, the nature of the stress as well as its distribution depending also upon the effects of the lantern load. Without careful analysis of the conditions at St. Paul's we could not possibly say anything definite concerning the stresses in the conical dome, and we notice that Mr. Dunn has avoided, probably for the same reason, any definite expression of opinion on the subject. Speaking in general terms, however, we think it very likely that for the greater part of its height the masonry of the cone is subject to tension. Accepting this hypothesis for the sake of argument, we find in it a justification for the seven circumferential ties which Mr. Dunn says are embedded in the cone at various levels between the top and bottom.

On the whole, we are quite in accord with the remarks of Mr. Dunn, where general principles only are discussed, but certainly in a manner that is of interest to all and of practical value to those who may happen to entertain incorrect views on the subject of dome construction.

We welcome the promise made by Mr. Dunn to bring forward at some future time a mathematical discussion relative to the dome of St. Paul's, showing with such accuracy as is possible the nature, intensity, and distribution of stresses in the structure, together with a completed isometric drawing illustrating the construction down to the base of the cone. A contribution of this character would be appreciated by all members of the Institute, and should be of special value to those upon whom devolves the care and maintenance of the Cathedral.

NOTES.

Lord Kelvin.

AS A theorist and a practical man of science, William Thomson occupied for fully forty-five years a unique position which, as First Baron Kelvin, he maintained for a further term of fifteen years with such distinction that his new name became even better known than the patronymic already famous as that of a gifted family which in two generations had given three professors to the University of Glasgow. In the domain of natural philosophy Lord Kelvin lived up to the saying, "All science is one science," as proved by his notable researches into the nature of matter, the phenomena of heat, light, and electricity, and his equally profound attention to other departments of physical science. As an exponent of the manner in which theory should be applied for the benefit of mankind he was pre-eminent. In solving the problem of ocean telegraphy and in the design of electrical measuring instruments, navigation apparatus, and even of so insignificant an appliance as the admirable water-tap that bears his name, Lord Kelvin showed an aptitude for grasping the true purport of his own teaching, which is not less desirable than rare. The very profundity of his knowledge begat humility of the kind unknown to superficial inquirers; the modest, lovable traits of his personal character left him unassuming under the highest scientific and temporal honours, and the unabated brilliancy of his intellect, coupled with an almost youthful enthusiasm, happily sustained him in active work, and continued to shed lustre on his great reputation to the close of a long and honourable life.

The Blackfriars-bridge Accident.

AT the resumed inquest by the City Coroner last week the two experts called in by the contractors repeated the evidence already given at the Board of Trade inquiry, but it is worthy of note that Mr. Moncrieff gave a probable explanation of the reason why the weight sustained by jack B became so much reduced as to disturb the equilibrium of the caisson and its system of supports. Mr. Moncrieff believes that the exhaust cock of

*The present article, it may be as well to say, was written immediately after the appearance of the Institute publication, but has been delayed owing to want of space in previous issues.

the pump at jack B was knocked off in some way before the collapse, and not as a result of the fall. We agree that accidental damage of the kind might easily escape notice, for this, as well as every other cock, was covered with sacking to prevent the contractors' men from being inconvenienced by the flow of water. A good deal of attention has been drawn, and quite properly, to the desirability of stiffening and bracing the girders employed in future caisson sinking operations. If Mr. Moncrieff's theory be confirmed or not, we think that consideration should also be given to the necessity for protecting the fittings upon whose integrity depends the sustaining power of the jacks. Sir Alexander Binnie and Mr. Basil Mott generally agreed with the evidence given by Mr. Moncrieff and Mr. Hogg, and Mr. Mott, after expressing his perfect satisfaction with the plant used at Blackfriars-bridge, mentioned the fact that the method of lowering the caissons there adopted was one which had previously received the entire approval of his late partner Sir Benjamin Baker.

The Conclusion of the Blackfriars Inquest.

THE verdict of the coroner's jury on the accident is what would have been expected from the general testimony of expert witnesses as summarised in the preceding Note. The probability (though one may still regard it as probability and not as absolutely proved) that one of the hydraulic jacks was not doing its work owing to an accidental injury just previously to the moment of the fall of the caisson, and that a tilting action of the caisson set in which drew the supporting girders over, is a theory which, at all events, explains the accident, and nothing else does. It seems to be admitted that all the plant was fully adequate to the work if nothing had gone wrong in the working. The moral seems to be that a greater margin of strength should be provided in the supporting girders, with a construction that would not permit of tilting, to allow for any similar case of unequal action of the jacks. Even if there were no accident to these, the simultaneous working of four hydraulic jacks at points a considerable distance apart depends on the care and attention of the men working them. This is one of the new and hitherto uncontemplated dangers attendant on dealing with immense weights, which are only learned from experience. It is sad that the lesson should be taught at the cost of four lives.

The Manchester Floor-Collapse.

THE serious accident which occurred a few days ago in Albert-square, Manchester, implies no blame whatever to the architect or the builder of the premises. The building was not a new one, although one of the upper floors had recently become the new home of the Manchester Fencing and Boxing Club. On the evening appointed for the opening of the new club rooms some 200 persons had assembled to witness exhibitions in wrestling, fencing, and boxing, and while the programme was being carried out, the floor, which was of ordinary timber construction, suddenly gave way in the middle, and assumed the form of two inclined planes, meeting and supported on the floor of the room below. We do not know the load for which this floor was designed, but no doubt it was quite appropriate to the original purposes of the building, but not for a load represented by a closely-packed assembly of athletic men, whose movement would be even more trying than their mere dead-weight. We have on several occasions alluded to the fact that the weight of crowds may be considerably greater than was believed to be possible a few years ago, and we feel certain that if the committee of the Manchester club had taken professional opinion they would have been advised not to accept this particular floor as satisfactory for the purposes of their association. Additional reason for this belief is furnished by information we have received that one or more of the main beams had been affected by dry rot. The accident points to the necessity of official examination before buildings or parts of buildings are permitted to be used for public assemblies of any kind.

Workmen's Compensation.

THE Court of Appeal, in the case of Johnston *v.* Mew, Langton, & Co., has decided that an appeal lies to a Divisional Court from the decision of a County Court judge sitting under the Workmen's Compensation Act, 1897, to decide the genuineness of a memorandum of agreement, and whether it shall be registered. In this case the County Court judge had decided that there was an agreement between the parties, and had ordered the memorandum to be registered. The Divisional Court reversed this finding on the ground that there was no evidence of any agreement between the workman and his employers, and the Court of Appeal affirmed this decision. Although certain new provisions have been inserted in the Act of 1906 relating to this subject there is nothing which would appear to prevent the above decision applying equally to such proceedings under the new Act.

Stopping up Highways.

THE closing of highways and the substitution of new ones is attended with many formalities. In a recent case, The King *v.* Justices of Surrey, *ex parte* Locke King, the Quarter Sessions having refused to enrol a certificate, an application for a mandamus was made to the High Court. An interesting point in the case was whether a print of the Ordnance survey, with a scale attached and a note appended giving the width of the highways, was a sufficient compliance with sect. 85 of the Highway Act, 1835, which requires a plan to be delivered describing the old and new highways "by metes, bounds, and admeasurement." The Court held that the word "admeasurement" implied that the length must be stated, and that the scale was insufficient information, since it had to be applied along a curved line. The decision of the magistrates was upheld apparently on all the grounds decided by them, and the Court intimated that these matters having been left by the Legislature for the consideration of the magistrates, in any event the Court would not have interfered by mandamus.

Canal Improvement.

A DEVELOPMENT of practical character is to be found in the decision taken by the Royal Commission on Canals and Waterways to institute inquiry, with the sanction of the Treasury, into the probable cost of improving certain waterways connecting the Midlands with the Thames and the Humber. It is stated that if the facts brought to light by this investigation appear to be of favourable character the Commission will also take into consideration the probable cost of opening up improved main routes between the Midlands and the Mersey and the Severn. Thus it will be seen that the idea of the Commission as to main routes is practically identical with that brought forward in the excellent paper read by Mr. Saner in 1905 before the Institution of Civil Engineers. The Commission evidently mean business, for they have already instructed Sir J. Wolfe Barry and Partners to inspect the line of canals extending from Brentford to Birmingham *viâ* the Grand Junction, Oxford, and Warwick canals, and the line of waterways between Norton Junction and the Humber *viâ* the Leicester and Loughborough navigations and the River Trent. The detour proposed *viâ* the Oxford Canal will obviate in part the difficulties attending water supplies on the first route without materially increasing the distance.

The Advertisement Regulation Act.

MR. RICHARDSON EVANS has done good service by drawing public attention to the Advertisement Regulation Act of last session and to the desirability that County and Borough Councils should forthwith frame by-laws under it. They now possess the power to enact by-laws to prevent advertising which will prejudice the amenities of a public park or promenade or impair the beauty of a landscape. We trust that local authorities will not allow the Act to become a dead letter, but will frame by-laws with the above object. Mr. Richardson Evans in his recent letter to the *Times* suggests that the by-laws should in effect follow the wording of the Act. But we fear that a by-law which stated that within a certain area a man should not exhibit an advertisement which impairs the beauty of a landscape would be too vague. Under such a by-law a man might be acquitted one day and convicted another, according to the personal views of the magistrates. We think the by-laws would have to be more detailed; that they would have, for example, to forbid advertisements on which the letters were above a certain size, or which were placed in fields. We give these only as instances. A large advertisement on the wall of a building might be allowed, one in an adjacent meadow disallowed, under such a by-law. In other words, the by-law will have to tell the advertiser exactly what he may not do.

Illuminated Advertisements.

A LETTER has been sent to us signed by Mr. Walter Crane, Mr. Joseph Pennell, and other well-known men, protesting against what they rightly term "the plague of flashing electric light adver-

tisements" which is so seriously on the increase in London. We do not print their letter, since it has already appeared in various daily papers; but we give the protest our cordial support. The prevalence of these flash-light advertisements is becoming a serious public nuisance, and is sure to increase unless some definite and decided movement of opposition to it is entered on. We notice only recently the introduction of a "Lipton's tea" flash advertisement in huge letters placed vertically the whole height of the old shot-tower near Waterloo-bridge. This kind of thing is completely vulgarising London, and ought to be stopped. The letter referred to has been sent to the Institute of Architects, the National Trust, the Society for Protection of Ancient Buildings, the Society of Antiquaries, the Architectural Association, the Topographical Society, the Society of Arts, and the London County Council. The signatories to the letter seem to be unaware of the existence of the well-known "Society for Checking the Abuses of Public Advertising," which is, oddly enough, omitted from their list; an omission emphasised by the appearance in the *Times* of a letter from the Hon. Secretary of that Society, immediately above their own letter. They have also contrived to make two mistakes in the names of the Societies cited; calling the Institute of Architects the "Institution," and the Society of Antiquaries the "Society of Antiquarians"—the latter an unpardonable blunder.

Fog Dispersal.

WE commend the decision made by the London County Council to abstain from the expenditure of public money in experiments of the kind proposed by Signor Maggiora. As Dr. Shaw pointed out in his Report on the subject, no evidence whatever can be adduced in favour of the theory that fogs might be dispersed by percussive action. The method proposed by Signor Maggiora for the removal of fog appears to be similar to that applied in Italy with the idea of dispersing hail-storms. We quite believe that hail and rain may be dispersed by the discharge of artillery, but that the process of dispersal is far more likely to be manifested by movement towards the earth than in the opposite direction. The facts are that when a fall of rain or hail is imminent, the atmospheric condition must necessarily be one of particularly unstable character, while, on the other hand, the pall of fog, which sometimes covers London and the surrounding country for many miles, is obviously in a state enabling it to offer passive resistance on a scale of enormous magnitude. Taking the weight of a cubic mile of damp air at five million tons, which is considerably less than that of fog-laden atmosphere, the total weight of air alone, to the height of a mile over the 693 square miles of Greater London, would amount to nearly 3,500 million tons. The idea of wafting away this stupendous load by the discharge of cannon, which are mere popguns in comparison, is worthy of Baron Munchausen.

The Buried Rivers of London.

THIS is the title of an interesting paper read last week by Mr. J. G. Head to the Auctioneers' Institute. The author pointed out that the drainage of London had greatly reduced the quantity of water yielded by various chalybeate and saline springs, of which the Roman Bath and the spring in Well-walk, Hampstead, are the best-known survivors. Small rivers, formerly beautifying what once were the suburbs of the Metropolis, have been turned into conduits forming part of the main drainage system. No doubt it is the case, as suggested by Mr. Head, that while the streams themselves have been imprisoned, their innumerable tributary rivulets still flow underground, and probably near the original water-courses. It must not be supposed, however, that anything like the former quantities of water can find their way into the subsoil, for pavements and surface drainage necessarily divert most of the rainfall—so far as concerns the central districts at least—into artificial channels communicating with the main outfalls on the Thames. Fortunately for those concerned in building operations the geological formation of the London basin is such that the general saturation line has been fairly maintained, although in isolated positions there is reason for believing that the security of buildings has been threatened by lowering of the underground water level.

Westminster County Court, St. Martin's-lane.

THE Westminster County Court, Nos. 82-3, St. Martin's-lane, has been pulled down for rebuilding by the Office of Works. The Court was established in 1846, with a jurisdiction which covered a wide area embracing nearly the whole of the original limits of the parish of St. Margaret (before the decretal of 1222 curtailed the parish), and bounded by the Thames on the south and south-east, Bayswater-road, Oxford-street, and High Holborn on the north, the City on the east, and a winding line from Chelsea Railway Bridge to the north end of the Serpentine on the west. The earlier sittings were held in the old Court of Requests, formerly a Baptist Chapel, on the east side of Castle-street, since absorbed in Charing Cross-road. The Court-house was built in 1848 on a site on the west side of St. Martin's-lane, which included that of No. 82, the coffee-house known, since about 1760, as "New Slaughter's," or "Young Slaughter's." The name of "Old Slaughter's" was thereupon taken by the earlier coffee-house, at No. 75 in St. Martin's-lane, which survived until the winter of 1843-4, when it was pulled down for the improvements upon Lord Salisbury's estate carried out by Chawner and Pennethorne, who laid out the road, Cranbourne-street, from Leicester-square to Long-acre; see the plans published in the *Builder* of July 2-9, 1904. "Old Slaughter's," founded in or about 1692 and familiar to readers of *Vanity Fair*, was a favourite resort of painters, and in later years of naval and military officers before the establishment of club-houses.

A Furniture Exhibition.

ON the first and second floor landings of Messrs. Debenham & Freebody's sumptuous new premises in Wigmore-street there is at present on view an admirable collection designed by and made under the direction of Mr. Ernest W. Gimson, which is worth a visit from those who like to see furniture not only unexceptionable in taste but thoroughly well made. Mr. Gimson's effects are got with little ornamental work, by means of simple lines, careful detail, thoroughly sound workmanship, and a judicious use of the natural colour and grain of different woods. Among the most notable specimens are a chest of drawers (6) in English walnut, inlaid in front with a rather elaborate conventional floral ornament in walnut and cherry; this is not a mere thin veneer, but is carried out in solid thick pieces. This is almost the only bit of elaborate ornament. A cupboard with drawers in English walnut (10) with simple crescent-shaped brass handles, is an excellent piece of work. The effect of different woods may be seen in the employment in some cases of burr oak and burrs of other woods, and in the use of brown ebony, a very dark wood but not without pattern, which can be obtained in larger sizes than the better-known black ebony. A small cabinet (27) entirely covered with a chevron marquetry pattern in three alternating woods—ebony, holly, and walnut, is most effective in appearance in spite of the simplicity of the pattern scheme, and is a model of careful execution of this kind of work, depending on the accurate cutting and fitting of innumerable small pieces.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held at the rooms of the Institute, No. 9, Conduit-street, on Monday, Mr. E. T. Hall (Vice-President) in the chair.

Mr. Hardwick Langston called attention to a statement in the minutes to the effect that at the last private meeting he desired to move an amendment which the Chairman ruled out of order on the ground that the proper notice had not been given. He pointed out that, as the agenda was dated November 23, and the meeting was held on December 2, and as, moreover, the agenda did not reach him and he did not see it till fifty minutes before the meeting, it was impossible for him to give the necessary fourteen days' notice.

The Chairman said the minutes, being a record of what actually took place, must remain as read, but Mr. Langston's explanation would be entered in the minutes of that night's meeting.

Mr. Alex. Graham, Hon. Secretary, announced the decease of Mr. Edward Morgan Whittaker, Associate, elected 1882.

Retirement of the Secretary.

The Chairman said, before the usual business was commenced, he would like to draw attention to the fact that this was the last general meeting at which Mr. Locke would be present as their Secretary, because he had resigned his position in consequence of the success he had attained in another branch of art. He was sure they would take leave of him as Secretary with great regret, although they hoped to see him frequently at their meetings as a visitor. Mr. Locke had been with them for ten years, and through the whole of that time had been a most courteous Secretary, and had made himself personally liked by everyone with whom he came in contact. The inevitable arose, of course, and Mr. Locke must go in order that he might shine with a bright light in another profession; but the meeting would wish him to know how they appreciated his work, and to wish him the very greatest success in that literary branch of art which he had chosen, and in which he had made such a conspicuous success. Mr. Locke could be assured that they would all watch his career with the greatest interest.

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Mr. Locke said it was not without some emotion that one could rise to take leave of a body with which one had been connected for so many years as he had as their Secretary. It had been a great privilege to him as an outsider to come into the very midst of a great profession, to see it in its artistic, professional, and social aspects, and to feel that in a way the whole of the profession revolved round him as wheels revolved around a wheel. It had taught him a great many things, and had brought him into contact with men who had naturally been of great use to him in the other profession which he had followed, and which he was going to follow exclusively henceforth. It had also brought him a great many friends because ever since he came amongst them as a total stranger he had been received by everybody, from the President of the Institute to the newly-joined Associate, both there and in the provinces, with uniform consideration, kindliness, and courtesy. It was because everyone all the time had always held out the hand of friendship to him that his leaving them now was a matter of great regret and considerable pain. He thanked them all for the consideration they had shown him, and for the kindly remarks the Chairman had made concerning him, and he hoped that as he was no longer able to serve them as Secretary, yet perhaps, by his poor efforts in other directions, he might be able to minister to their edification.

Recent Fire Legislation for London.

Mr. W. Woodward then read a paper on "Recent Fire Legislation for London under the Factory and Workshop Acts of 1895 and 1901, the London Building Act, 1894, and the London Building Act (Amendment) Act, 1905," of which the following is an abstract :—

Mr. Woodward said that modern invention had led to the introduction of materials and methods of protection from fire which vastly increased the opportunity for clearing a building of its inmates before the fire had a chance of getting well hold of the structure. This consideration had not received the attention it deserved, either from the fire insurance companies, or from the authorities administering the protective Acts of Parliament. Sufficient study, again, did not appear to have been given to what are and what are not the best fire-resisting materials. It was by no means certain that the iron staircases to be seen outside large buildings in London would not prove a delusion and a snare in the case of a big fire, even assuming that nervous persons could be induced to use those staircases at all. As regards granite and other stone "deemed to be fire-resisting" "by reason of its solidity and durability" (Act of 1894, Schedule II.), these materials could not be relied upon in the case of a big fire. The requirement in Schedule II. that timber and iron in beams or posts must be protected by plastering in cement or other incombustible or non-conducting external coating was, at least in the case of timber, quite unnecessary. Timber was one of the best supports to a building on fire, and required no external covering of the nature described. The provision of oak, teak, or other hard timber for staircases was also unnecessary; good, sound yellow deal or fir would be equally effective in the case of fire. If some undoubted preservative of timber from the effects of fire could be secured, much cost and trouble would be saved. Profesor Abel had specified the painting of the surfaces with a diluted solution of silica of soda and lime-wash, then with slaked fat lime of the consistency of cream, then with a stronger solution of silicate.

The author referred to the recent fire in Commercial-road, Lambeth, where two persons were burnt to death. Since January 1, 1906, twenty-five lives had been lost, and upwards of 500 seriously endangered, in houses of a similar type, consisting of shop with room at back, passage to stairs leading to first and second floors, lath-and-plaster partitions matchboarded in parts, and no way out to roof. The County Council now required a partition to be put up in such houses at the top of the staircase, forming a lobby, over which was a trapway escape to the roof, and thence by iron fixed ladders, if required, to the roof of adjoining premises. No reasonable objection could be raised to this simple and inexpensive requirement.

Discussing some of the provisions of the Factory and Workshop Act, 1901, attention was directed to some undesirable requisitions under subsection 2 of section 14, which had given rise to much litigation and much cost. A difficulty had arisen when a "factory" was in different occupations; the upper floors may have urgently needed means of escape in case of fire, which could only be provided by interfering with premises beneath, above, or surrounding, the owner of which, not having forty persons employed, was outside the Act, and would not allow any means of escape to pass through or interfere with his holding. The London County Council, experiencing this difficulty, had provided for it in the London Building Act Amendment Act of 1905. Dealing with the working of the latter measure, Mr. Woodward referred to the three cases—viz., in regard to 13 and 15, Leather-lane, 1 and 2, Gracechurch-street, and 41 and 42, Beech-street—in which Mr. Percy B. Tubbs had been successful in his appeals to the Tribunal of Appeal against the provision of ventilating lobbies in these buildings, each of which was under 1,000 ft. superficial. Mr. Tubbs in his evidence, as reported in the *Builder*, stated that he had experimented on one of these smoke lobbies and found that the air was drawn into the room rather than the smoke driven out of it, and that on opening the door leading to the staircase the smoke rushed up the staircase; this appeared conclusive proof that the ventilators acted as inlet ventilators, and not as exhaust ventilators. It appeared also that the London County Council Building Act Committee were prepared to consider proposals of various alternative measures of escape, and one of them was a means of communication with adjoining buildings by means of ladders; but unfortunately the adjoining owners would not agree to these ladders—which formed an inexpensive and satisfactory means of escape—being placed on their premises. Mr. Woodward congratulated Mr. Tubbs on the success of his appeals. The result had been that the Building Act Committee of the London County Council had, according to the *Builder*, reconsidered the practice of the Council in cases arising under sections 7 and 9 of the Act, and had determined that, in similar cases to those the subject of the above appeals, an enclosed fire-resisting or incombustible staircase with means of escape to and from the roof should be deemed sufficient for the purposes of the Act.

The author, having referred to the absurdity of exempting certain buildings and institutions from the fire provisions of the Act, went on to summarise the machinery by which the Amendment Act works, dealing with "high" and "new" "twenty-person" buildings under the headings of (*a*) as regards the owner; (*b*) as regards the Council; (*c*) as regards the Tribunal of Appeal; (*d*) as regards the practice of the Council. Reference was made to the difficulties created by the "cubical extent" clauses. Since 1894 trades had been opened up—such, for instance, as drapery establishments, engineering works, motor-car showrooms—which had been much hampered in their uses and developments by the fact that the Council had no power to allow more than 450,000 cubic ft. without obstructive party-walls and iron doors. The Council had themselves seen how detrimental these provisions had been to modern ideas of large areas for modern buildings, but they had to keep in mind the risk of serious conflagrations when such large buildings were not subdivided by party-walls. The Council had now determined, he believed, to apply to Parliament in the session of 1908 for power to amend the Building Act of 1894, as regards the cubical extent of buildings, in the following manner, viz. :—(1) Sect. 75 to be amended so as to enable the Council to allow horizontal separation; (2) sect. 76 to be amended so as to remove all restrictions on the Council's power to allow increased cubical capacity for buildings of the warehouse class; (3) sect. 77 to be amended on the lines laid down in the London Building Acts (Amendment) Bill, 1905, so as to give the Council discretionary power with regard to openings in party-walls, the provision of fire-resisting doors constructed of materials other than iron, and the uniting of buildings. Amendment in the direction indicated would be a matter of satisfaction both to architects and to the public.

In his conclusions the author expressed the hope that the provisions of the Act would be interpreted in a fair and reasonable manner. The Act gave considerable latitude to the Council, and in practice it would be found quite reasonable to ease off some of its provisions. He would leave each case to be dealt with by the Council literally on its merits; and as in our Courts of Justice all decisions were subject to appeal, it might be desirable to give power to leave every decision to a Tribunal of Appeal. He thought the 9-in. newel wall to a staircase might be omitted in many instances; that the smoke lobbies might be omitted altogether; that the thickness of a wall-string might be less than 1¾ in.; that the thickness of the panels of doors might also be less than 1¾ in.; that the reduction of height in buildings from 60 ft. to 50 ft. was unnecessary, as the London Fire Brigade ought to be provided with appliances capable of rescuing persons from a burning building at a greater height than 50 ft. He was glad to see the elastic way in which the London County Council was dealing with projecting shops. He hoped the Council would modify all its requirements in the way of ventilating areas, including, of course, the vexatious trunks inside, and gratings in the fronts of buildings to take air into those areas. He should rely a little more on the ability to get out of a building on fire before that fire got a hold, but he would not stop short in any house in London in insisting upon a way out to the roof, and, having got there, a way on to adjoining premises.

Mr. J. Douglass Mathews, in proposing a vote of thanks to the reader of the paper, said he agreed generally with what had been said. Mr. Woodward had referred to the smoke lobbies of which they had heard so much lately, and he was glad to know that the County Council had seen the desirability of not taking further steps in this matter. In the three cases quoted, in which he was interested, he had looked at the subject in every light, but could not convince himself of their necessity or reasonableness. When he mentioned the word "reasonable," he felt the Institute had a great deal to boast of in having been able to get that word introduced into the Act. In the first instance, it was not in the Bill; but subsequent proceedings, he thought, had shown the value of having it inserted. Another suggestion made by the Institute was that in all cases where the Council had discretion it should be subject to the Tribunal of Appeal. The Act was a very difficult and an important one, as differences of opinion must necessarily arise, not so much, perhaps, in the principle as in its adaptation. Mr. Woodward had pointed out one of the difficulties as to the provision of means of fire escape from the roof in a private house. But take houses where there were no parapets and which had overhanging eaves; there was a difficulty. Suppose some kind of protection in front of the trap-door, or whatever it might be, the very fact of having to mount this obstruction to gain the fire escape might possibly lead to sad circumstances. Unless the means of escape was simple and easy, it rather became a trap than an advantage. He agreed that the County Council were taking an elastic view of things. It was a difficult thing for any body charged with the duty of requiring provision for fire escape from every building in London to take upon itself the great responsibility which this entailed, and he believed it would very much simplify matters so far as the County Council was concerned if they made suggestions to owners as to provisions they considered necessary, and thus put the onus of responsibility upon the owners. It would save the County Council a great deal of trouble, and would also throw a great responsibility upon the owners which they would not feel disposed to incur. As it stood at present, if regulations were not made and enforced by the County Council, owners would say they would shelter themselves under the non-procedure of the County Council. He thoroughly agreed as to the objection of grandmotherly legislation, and thought if the public were treated as sensible beings a great deal would be done without the pressure of the local authority.

Mr. W. E. Riley (Superintending Architect, London County Council) seconded the motion and said the subject had a gruesome side.

Fire in buildings, and especially domestic buildings, was a tragic question and needed every care and consideration. He could not help being struck, in the Committee Rooms of the Houses of Parliament when the amendment Bill was before Parliament, with the monotonous testimony of every witness, whether for or against the Bill, as to the necessity of something being done. They found those who were rather inclined to criticise the original clause, and who came with nostrums and remedies for defects; but nothing impressed him more than their surrender to the point that nothing which tended to save life in case of fire should be neglected. That was the crux of the whole question they had to deal with. They must consider what provision should be made in these buildings in a reasonable and temperate manner to save life in case of fire. He was glad at the same time there was no disposition to charge those responsible for the administration of the Amendment Act with the iron inflexibility which had been too much spoken of in the past. The Building Act of 1894 contained very many positive and decisive clauses which did not permit of the County Council changing the actual wording or the intention of the words in the various clauses, and that was the reason why these Acts of Parliament were so unpopular. It was an easy thing to discharge another man's responsibilities, especially when the consequences were left with the owner of the responsibilities; but there were a few statistics on this matter which he thought they ought to have. Everyone knew that the promotion of the 1905 Act was due to the dreadful fire which occurred in Queen Victoria-street. In that case the jury added a rider to their verdict stating that the Building Act needed amendment in the direction in which that fire gave experience. The Home Office also made representations that the Building Act of 1894 needed amendment. There had been a good many fires previous to the promotion of the Bill which had great influence on the trend of the clauses. From 1890 to 1904 there was rather a gruesome list of deaths from fires in buildings of this kind, and it was this which caused the promotion of sect. 12 of the amending Act dealing with the means of escape from the roof. In November, 1890, there was a fire in North Hackney in which eight persons were killed; in 1896, at 167, Mare-street, Hackney, an oil store, four persons lost their lives; in December, 1890, at Clerkenwell-road, one person was killed; in November, 1901, at 127, Judd-street, three persons lost their lives; in April, 1902, at 423, Hackney-road, four persons were killed; in June, 1902, at the Queen Victoria-street fire, ten lives were lost (the latter was a twenty-person building); in November, 1902, at 72, Royal Mint-street, three persons were killed (this was a twenty-person building which came under sect. 9); in December, 1902, at 25, Ben Jonson-road, six persons lost their lives; in October, 1903, at 386, Hackney-road, three persons were killed in a projecting shop; and in February, 1904, at 3, Duke's Head-passage, seven persons were killed; again, in October, 1904, at a fire in Judd-street, several persons lost their lives. The toll altogether was fifty-eight lives lost. Since the Act came into operation in January, 1906, twenty-seven lives had been lost in buildings coming within sects. 9, 10, and 12 of the amending Act, and 510 lives had been seriously endangered. Of these 510, 268 left the buildings by other methods than by the ordinary means of escape provided. It was just as well to know what the Council had done in the past in these matters. Since they had powers the Council had dealt with 400 theatres, music-halls, concert-halls, and similar licensed buildings, and 200 other buildings which had since dropped their licenses had been dealt with. They had further dealt with 400 common lodging-houses, 1,500 factories, and 150 buildings 60 ft. high. From none of these cases had a single life been lost by fire. As to the buildings which had been dealt with under the Factory Act, there was the Incandescent Light Co.'s premises at Westminster where a fire occurred in May, 1902; there were 100 men and 500 girls employed there, but they got away from the building without any injury to anyone. At the Hatcham Saw Mills, in December, 1904, 250 persons left by the means of escape; at Lipton's premises in Caton-street, on December 17, 1906, 250 persons left by means of the staircase provided; at 70, Old-street, in June, 1907, forty persons escaped without damage, and at Woodfield-road, Paddington, on November 4 last, 150 persons escaped.

A member: Was this by an outside means of escape?

Mr. Riley said that most of them had internal staircases. They had also to note the recent letter sent by Capt. Sir Eyre Massey Shaw and Capt. Wells as to fire protection in hospitals; they suggested alternative means of escape in the case of those buildings. He had been asked by the Council to advise in the case of several hospitals, and he always felt that these were extremely dangerous buildings unless reasonable and sufficient means of escape were provided. The patients were incapable of moving themselves and must be carried, and personally he felt that if slopes could be provided at a fair incline instead of staircases it would be a great deal better in hospitals. As to ventilating lobbies, the County Council felt that in small buildings it would be rather a stretch of the word "reasonable" if two staircases were asked for; but at the same time it was considered that to only have one door between a possible fire and the only means of escape in the building was a somewhat dangerous thing. They endeavoured, therefore, without loss of floor space, or at least with the absorption of the minimum of floor space, to put two checks between the fire and a means of escape. They did not want to enforce upon owners the extreme trouble, expense, and loss of space, to provide an alternative means of escape, where floor space was so valuable; and he felt that when the smoke lobby was devised it was a reasonable and a most economical solution of the difficulty. An illustration of what was required occurred on April 4 at 28, Gunn-street, where forty persons were prevented from using the staircase for escape, owing to one of the staircase doors on the first floor being temporarily out of order just at the time the fire occurred. After all, the amending Act of 1904 was the evolution of professional opinion, particularly with regard to the projecting shops.

Mr. Maurice B. Adams asked, in reference to the escape staircases which were proposed for domestic buildings, whether in many cases these would not seriously lead to an increase in burglaries. He had something to do with this side of the question in connexion with one of the largest offices engaged in burglary insurance, and it occurred to him it would be a very serious thing to indiscriminately provide a number of iron ladders to the tops of various premises over which they had no control. A burglar would be able to escape along a whole range of buildings and eventually get to the ground through an unoccupied house. While being entirely in accord with the necessity of providing means of escape from fire, he saw a difficulty in dealing with the matter in this particular way.

Mr. J. Slater said those who had the responsibility of protecting persons from the risk of fire must feel that responsibility very heavily indeed, and there was probably no person present who, within recent years had not gone into buildings in various parts of the metropolis and had come away feeling that they were positively death-traps. While, therefore, sympathising with Mr. Riley, he thought there was a great deal in what Mr. Woodward said as to the inadvisability of laying down too hard and rigid lines, either from the point of view of the building-owner or of the authority charged with the protection of inmates of buildings from fire. Surely, the safety of the lives of thirty-nine or of nineteen people was nearly as serious a matter as the safety of the lives of forty-one or twenty-one persons, and he could see no object in laying down rigid conditions when they knew they were were often a hardship when enforced, and when, on the other hand, they could often be evaded in a way which he felt was criminal. The conclusion he had come to with regard to a large number of the restrictions and conditions laid down in the amending Act was that it would be infinitely better to leave the matter in the hands of the County Council or the District Surveyor to treat each individual case on its merits. They could not lay down rigid rules to fit every case, and Mr. Riley had admitted that the County Council were under great difficulties in carrying out the 1894 Act because of having no power to vary the conditions. Mr. Riley knew perfectly well that iron doors were expressly specified, and it was only by a very roundabout issue that they were able to use armoured doors, which the County Council knew were better doors for the purpose. Then, with regard to Mr. Adams's point as to burglaries. In hotels the regulations of the County Council were to the effect that the exits must only be protected by a bolt which could be opened by the slightest pressure from the inside. In such cases it would be perfectly easy for a dishonest waiter to let in burglars. Both in the case of the amending Act and in regard to many clauses of the original Act, it was hard lines on the architect who tried in every possible way to meet what he felt were reasonable requirements, to have cast in his teeth the fact that he must be bound by regulations which were made for the people who tried to evade them. In the last two or three years he had had to go to the County Council on many occasions, and must testify to the extreme courtesy and consideration with which he was met. In the case of large buildings one very considerable element for consideration as to danger from fire was the position in which they were placed. If a large building were surrounded by narrow streets where it was extremely difficult for fire-engines to move, the danger to the buildings was enormously increased compared to what it would be if it were surrounded by wide streets on two or three sides, from whence a fire could be easily attacked.

Mr. G. A. T. Middleton suggested that in the case of domestic buildings with eaves where there was a difficulty of obtaining access to the roof, and in protecting the roof so that the inmates could get from building to building, it might be possible, instead of extending the access to the roof, to allow an external balcony at the level of the top floor.

Mr. S. Hurst Seager, of New Zealand, pointed out that in New Zealand they provided continuous balconies outside each window in hotels, which were fitted also with iron ladders. On the lower story the ladder was slightly suspended so that the catch could be easily released and people could get to the ground.

The Chairman: You can see that here at the Savoy Hotel.

Mr. Seager said that there was no such provision in the hotel he was staying at, but it was a thing found to work remarkably well in New Zealand. A thing which struck him in the case of the London County Council regulations was that no provision was made for blocking at the exits. He saw that this was the weak point twenty years ago, and every fire which had occurred since strengthened his view that the danger lay in the blocking of the exit. In the fire at Chicago the greatest number of deaths took place in the corridor, which was 11 ft. or 12 ft. wide, simply because the architect had put slight projections on the side of the walls, and the human mass formed itself like the voussoirs of an arch, and the people were crushed to death by the pressure from behind. They had only to look at people coming out of a place in an orderly kind of manner and contrast them with people striving to get into a building to get the front row, to see the danger. In any ordinary place of entertainment they would see in a 3-ft. or 4-ft. opening six, seven, or eight persons were sufficient to block the entrance. The pressure formed the arch, and it was impossible for the people to get in. The aim of architects should be to avoid this pressure. Without resistance there could be no pressure, and he suggested it might be removed by putting curved pieces to the doorway so that people coming through would not have the pressure behind them. This was an important point which he thought architects should give their attention to, and it was one which, he believed, the London County Council had taken no heed of.

The Chairman said there was no self-respecting person in London but what would agree with the principle of the Act, for anything to prevent loss of life commended itself to every person who reflected at all. It was perfectly fair to say of architects, who had not only their responsibility as citizens, but their responsibility as professional men to

their clients, that they were most scrupulously anxious in designing their buildings to make every provision which was necessary for the escape of persons in the event of fire. He confessed, however, he desired that the Act should be made as elastic as possible. Very frequently difficulties arose because there was no discretion left to anybody. There were some matters which he dealt with when he was giving evidence before the Parliamentary Committee. For one, he did not see the necessity for an escape to the roof in the case of detached houses standing in an acre of land. Who would dream of a person in the case of a detached house at Hampstead Heath or Sydenham Hill going to the top of the house to escape in case of fire? It was an unnecessary expense, and in some cases it was not necessary to insist on having staircases even where there were twenty persons in a big house. If there was a back staircase and a front staircase and some other means of escape, it was not necessary in such circumstances to have an iron staircase. Such a staircase was often a great trouble and invited burglars. Mr. Riley had given them a very interesting list of fires where deaths had resulted; but it must be remembered that in many cases dangerous trades were carried on on the premises, or else they were dangerous premises, and while it might be quite reasonable to make laws which would affect such businesses and premises, yet the same things did not apply to a new building constructed in these days of different materials and with different surroundings. In these latter cases there might be much greater elasticity. With regard to the ventilating lobby, he felt there was a much simpler way of getting out of that difficulty. He believed that the Tribunal of Appeal cases which had been mentioned were factory buildings.

Mr. Gruning said they were not factory buildings, but they might be buildings where twenty people were employed.

The Chairman said that instead of having glazed windows to the staircases, if the window openings were glazed only halfway up there would be no danger whatever in respect to the smoke, as it would go out immediately. He had, personally, built some very large factories in London, and invariably made his staircases like that. If the door opened on to the staircase properly and the windows were half-glazed and half-unglazed there would be no danger to persons escaping. As to hospital buildings, while the report which had been referred to might be useful for the hospitals which had been visited, yet he believed that in most cases hospital buildings were built in the way suggested.

Mr. Riley said that was not so.

The Chairman said he had put up a good many hospitals all over the country, and had never built a staircase in any other way. In old hospitals it had not been done because the then boards of management had not thought of it, but in the case if the Metropolitan Asylums Board all their hospitals were protected in the way suggested. Balconies were an excellent escape in case of fire, but were very objectionable from other points of view, as it was so easy for a burglar to pass from one room to another. It was sometimes said by those who looked at the thing from one particular point of view that the architects did not make sufficient provision for fire escape but it had to be remembered that the architect had to look at the thing from many different points of view. He agreed with what had been said as to the reasonableness of the London County Council if one could only get to headquarters.

The motion was heartily carried.

Mr. Woodward, in reply, said they would all agree that the London County Council had dealt with the measure in an elastic fashion, and had endeavoured to deal with each case on its merits. Mr. Riley's figures were interesting, but he (the speaker) had endeavoured to present both sides of the case. He took it that Mr. Adams referred to Sackville-street when he spoke of the series of ladders and burglars going from house to house. He would like to see that, as it would give him a better regard for the vigilance of the Metropolitan Police than he had at present. Mr. Slater supported his plea for the abolition of a hard-and-fast line. They must have confidence in some authority, and if they only had an authority constituted which would deal with that matter in a reasonable manner there would be no complaint. They had heard of the absurdity of having an escape to the top of a house where it stood in a large area of land, and he had the case of an hotel at Buxton which stood in its own grounds, and which the local authority would not allow to be opened till a means of escape to the roof was provided. After going to the expense of this, he was bound to confess that when the inmates got to the top there was no means of getting down. As to Mr. Middleton's suggestion, the difficulty was to get the adjoining owner to allow a balcony which would allow access to his premises. He considered the suggestions of Mr. Seager were most useful, and should engage the attention of the London County Council. As to the half-glazed windows, he should have thought that, as even London was sometimes cold, there would be difficulties.

The Chairman said he had carried out the practice in a large number of buildings in London.

Mr. Woodward said it was certainly a remedy with regard to smoke.

The Chairman announced that the next meeting, which was a business meeting, would be held on January 6.

THE ASSOCIATION OF WATER ENGINEERS.

THE twelfth winter meeting of this Association was held at the Geological Society's apartments, Burlington House, W., on Saturday morning last week, when the chair was taken by Mr. Christopher Sainty, M.Inst.Mech.E., President.

Water Supply of Malvern.

The minutes of the twelfth annual general meeting, held at Windsor, having been read and confirmed, and other business, including election of Council and officers, having been transacted,

Mr. W. Osborne Thorp, Surveyor and Waterworks Engineer, Malvern, read a paper on "The Water Supply of Malvern." After a general description of the works, illustrated by diagrams, etc., he said a few words in reference to the distribution works. With a difference of over 900 ft. in the levels of different parts of the district, which extends over an area of 5,200 acres, it would, he said, be readily understood that the difficulties of distribution were considerable, but by means of service reservoirs at various levels this difficulty had been overcome, though pumping was necessary to reach the highest points. The pressure in the mains varied from 10 to 215 lb. per square inch. With regard to charges, the Malvern Water Acts gave the Council the option of charging by water meter or by rate, and since 1894 the whole of the supply, both for domestic and other purposes, had been by meter. Until within recent years the charge for water had been 1s. 3d. per thousand gallons, but owing to the heavy expenses recently incurred the present rate was 1s. 8d. Malvern is a comparatively wealthy district where the cost of a few thousand gallons of water for sanitary purposes did not weigh heavily upon the inhabitants, whilst it was undeniable that had it not been for the meter system the town could never have come through the ordeal of 1904-5 as it did. The average consumption of water was but 16 gallons per head in the winter and 18 gallons in the summer, and 20 gallons when heavy quantities were required for street watering. The low consumption in Malvern was doubtless due to the extra care exercised by consumers in the use of water and in the discovery and repair of defective fittings, due to the knowledge that every drop wasted had to be paid for. Again, in a town such as Malvern, where gardens were such an essential feature of the place, the use of water therein would be far beyond any return obtainable by a fixed rate on the usual scale. As regards meters, there were about 2,050 in use, of which 1,870 were of one type, which, though rather expensive, had been found to be the most reliable and accurate in ordinary use. The cost of upkeep was rather difficult to ascertain accurately, but, including labour in fixing and changing the meters, the annual cost was 115*l.* for labour and about 42*l.* for renewals, making a sum of 1s. 6½d. per meter per annum. The capital outlay on meters was at least 8,200*l.*, whilst the income per annum was 872*l.*, from which must be deducted 157*l.* working expenses, leaving a balance of 715*l.* per annum. Taking a number of large houses where no other source of water was obtainable, the average consumption per day worked out at about 17.8 gallons per head. It was interesting to note that the charge of 1s. 8d. per 1,000 gallons and 8s. for meter rent, which was apparently high, only represented a rate of 1s. 1½d. in the *l.* on the assessable value of the houses supplied.

The Water Supply of Paris and Suburbs.

A vote of thanks to Mr. Thorp having been agreed to, after a long discussion,

Mr. Easton Devonshire, A.M.Inst.C.E., read a paper entitled "Notes on the Water Supply of Paris and Suburbs," which was a report on a recent visit to Paris of a small number of members of the Association. The waterworks visited were comprised in three distinct undertakings, *i.e.*, those of (1) The City of Paris supplying the population contained within the ring of fortifications, (2) The Compagnie Générale des Eaux supplying all the suburban communes surrounding this ring with the exception of those enclosed in the loop made by the Seine to the north-west of the city, (3) The Compagnie des Eaux de la Banlieue supplying the district defined by this loop of the river.

The supply to the City of Paris was dual, he said, the potable supply being entirely separated from the water required for other uses than drinking, each water having its own reservoirs and distributing mains. The potable supply was obtained from springs situated at distances from Paris varying from 46 to 108 miles and brought in by four aqueducts discharging into immense reservoirs situated, one on the north-east receiving the Dhuis spring water, one on the west the waters of the Aver, and one on the south into which flow the waters of the Vanne and Loing conveyed by their respective aqueducts. A supplementary supply of potable water was provided from the rivers Seine and Marne after filtration at Ivry and Saint-Maur. Of the three principal reservoirs, all of which were situated within the line of fortifications, two, viz., the Menilmontant and the Montsouris reservoirs, were built fifty years ago by Belgrand, and were in two stories, the third reservoir, that of Saint Cloud, being completed in 1899, to the designs of M. Bechmann. This reservoir, which was in three compartments on the same level, contained 66 million gallons, so that its capacity was ten per cent. greater than that of the Honor Oak reservoir now in course of construction for the Metropolitan Water Board. There were, in addition, fifteen distributing reservoirs for potable water, some within and some without the ring of fortifications, the capacity of the eighteen reservoirs being: spring water 134,310,000 gallons, river water 33,770,000 gallons, and Ourcq water 5,434,000 gallons. The supply of water for uses other than potable was obtained from the Ourcq Canal by gravitation, and from the rivers Seine and Marne by pumping without filtration. The official report for 1906 stated that the length of distributing mains was at the end of last year 1,656 miles, of which about eighteen miles were coated sheet-iron or steel pipes, and seven and a half miles of armoured concrete. The total quantity of water drawn from the aqueducts last year was over 19,000 million gallons, that supplied from the filtering stations 16 million gallons, the volume of water used for purposes other than drinking being nearly 39,000 million gallons. The grand total for all purposes amounted to 58,240 million gallons, which for an estimated population of 2,763,393 persons gave a supply per head of 57½ gallons per day. The pumping stations, primary and relay, numbered fourteen, and contained pumping machinery of 8,330 h.p. nominal, of which 700 was hydraulic power. The total quantity of water pumped during the year was 15,517,301,800 gallons, the average lift being 182 ft. The almost exclusive use of single-cylinder horizontal engines was a peculiarity which struck many of the visitors. The boilers most in favour were tubular or semi-tubular, the latter, known as the Roser boiler, being the type adopted in the most modern plants.

The method generally followed in Paris of laying the mains in sewers or in specially-designed culverts was, he believed, unique among the water supplies of great cities.

The economy which it was claimed resulted from its adoption was conceivable only on condition of the original construction of the sewerage system and the water mains being designed simultaneously at the outset. In London its advantage to the public comfort in the avoidance of the continual breaking up of the roadway would be enormous, but to rearrange its sewers and water mains would, independently of its gigantic cost, make the Metropolis an exceedingly uncomfortable place to live in for a generation. The trip the visitors made through a portion of the main sewer was most interesting. In this sewer, carried over their heads on brackets or iron standards, were two trunk mains, 24 in. and 32 in. in diameter, besides smaller pipes for water and compressed air, and many telegraph and telephone wires. The method of jointing the water mains aroused special interest. The practical way of making a tight joint with collars so large in diameter and so narrow in width seemed so puzzling that the author had obtained from M. Vibert, the engineer in charge of the mains, the following information:—

"The pipes with ring collars are used in the sewers only and never in the ground; this system of joint is evidently less solid than the socket joint; it lends itself, however, to great flexibility, but over metallic bridges and in unstable ground we prefer the Gibault joint, which is still more flexible. Originally the collar had a width of 4 in. only, whatever the diameter of the pipes (even with 44-in. pipes). For the last twelve years the dimension of the collar is 4 in. up to a diameter of 24 in., but it is 4¾ in. for 28-in. and 30-in., 5¾ in. for 36-in., and 6 in. for 40-in. and 44-in. pipes. In laying, the collar is slipped over the pipe, placed astride the joint, and centred by means of small lead wedges, which leave a regular space round the pipe. After placing the clay fillet the lead joint is run and set up without difficulty, and without special precautions to prevent slipping. In case of removal of a pipe the materials may be used again without waste; the collars, which are slightly conical, are driven off by blows from a hammer, and the pipe rolls out. As for the pipes, the only precaution taken by the manufacturer to avoid breakage is to wrap them round near the ends with straw bands. Handling in store and transport to the work soon destroy the straw, but breakages are rarely experienced."

This joint was economical in lead, and was evidently perfectly reliable in cases where the pipes were rigidly supported, and where there was no liability to strain or vibration.

"Armoured" concrete pipes had been largely used in Paris for both sewer and water and for high and low pressures. M. Vibert had supplied a note on these pipes, with drawings of the various forms of joints for high pressure recently introduced by M. Bonna and by MM. Latron and Vincent. The length of armoured concrete pipes used for water supply amounted on January 1 last to 12,000 metres, or seven and a half miles, of which 1,800 metres were 60 in. in diameter, 4,800 metres 49 in., and 5,400 metres 44 in. There were in addition 180,000 metres, or 112½ miles, of low-pressure pipes in connexion with the sewerage system, these pipes ranging in diameter from 12 in. to 80 in. M. Vibert gave particulars of two systems of pipes used by the City of Paris Water Department—those of M. Bonna and of MM. Latron and Vincent. The former was already known in this country, but as far as the author was aware the latter had not yet been used on English waterworks. The pipes described were specially intended for medium or high pressures, and capable of resisting test pressures of 60 lb. to 150 lb. per square inch. He might say that many miles of concrete pipes with steel "armouring" of other systems were used in Paris for low pressures, especially in connexion with the sewerage system, these being sometimes in the form of continuous conduits moulded *in situ* without joints or cast in lengths, usually of 10 ft., with joints formed of double collars of armoured concrete run with cement. The best-known names among the French contractors who had constructed sewers and pipes for low pressures were Coignet, Chassin, and Bordinave. Concrete pipes, with simple armouring of rings and rods, would withstand pressures up to 30 lb. on the square inch, but above these pressures the porosity of the concrete caused sweating, and it became necessary to introduce a water-tight lining into the concrete. The Bonna pipe consisted of a cylinder formed of sheets of steel from 1 to 2 millimetres in thickness, soldered together by the oxyhydrogen flame, and surrounded on its outer side by an armouring of steel rods of ⊤ section arranged in spiral and connected horizontally so as to form a network, the weight and spacing of the rods being calculated to resist the radial pressure due to head of water to which the pipe was subjected. A second and lighter network of steel rods was placed within the sheet-steel cylinder to serve as a binding for the cement forming the inner face of the pipe. The steel framework of the pipe was placed in a vertical mould provided with a collapsible mandril and concrete grouting composed of 800 kilogrammes of quick-setting cement to 1 cubic metre of river sand was run in on either side of the steel cylinder.

For use as mains for high pressures, M. Bonna had introduced several improvements, especially in the joints. The type of joint selected by the Paris Water Department for high pressures was that already in use in Brussels for a 28-in. main. The ends of the steel cylinder, which was increased in thickness to 2 millimetres, carried angle rings turned outwards. Over these was placed a steel collar 4 in. wide. Gaskets of tarred rope were introduced from each side of this collar and packed against the angles, and three strips of lead were inserted on each side of the joint and set up. The joint was completed by a double collar of armoured concrete, the space above and around the lead being filled, as before, with cement grouting. An order had been placed for four and a half miles of pipes of this pattern—in pipes 49 in. in diameter to withstand a working pressure of about 120 lb. per square inch. It was stated that their cost laid, including trenchwork, would not exceed 2*l.* 5s. per yard run.

The Latron and Vincent pipe had also been used in Paris for one and a half miles of 49-in. main for a test pressure of 60 lb. per square inch. It differed in principle from the Bonna pipe. The steel cylinder was on the inner face of the pipe. It was 3 millimetres in thickness, and corresponded to the theoretical pressure of 60 lb. to the square inch. The cylinder was formed of steel sheets riveted together and strengthened by an outer armouring of ⅜-in. round iron rings placed 2 in. apart and attached horizontally to ¼-in. longitudinal rods spaced at 6 in. The ends of the steel cylinder extended 1¾ in. beyond the concrete. The pipes were cast in vertical moulds, the concrete being from 2 in. to 2¼ in. thick, and wholly outside the cylinder. The concrete was composed of a mixture of quick-setting cement, sand, and gravel. In making the joint the annular space of a few millimetres left between the ends of the adjacent pipes was temporarily plugged. The exposed ends of the cylinder were cleaned and painted over with tar. A W.I. collar, in two halves bolted together, was placed over the joint and bitumen run into it, the collar being left in place. The joint was completed by a double collar of armoured concrete filled with cement grouting in the usual way. Of 152 joints, of which the majority were tested to 45 lb. without the double collar, nine had to be remade. other joints leaked slightly at first, but took up rapidly. No repairs had been necessary during the two years they had been under pressure, but secretions of lime had been observed on the outside, as in the case of the Bonna pipes.

It was interesting to note the use of plug-cocks on pipes up to 4 in. in diameter. These cocks were known as Gibault cocks. They can be manipulated without giving an excessive shock in the mains. The method employed for connecting service pipes by means of a tee-piece fixed to the main by iron straps appeared to the visitors somewhat primitive. To permit of tapping under pressure, the vertical portion of the tee-piece was provided with a leather flap valve which was pushed aside by the drill while piercing the main. The reason alleged for not using tapping machines was the fear that the pipes would not stand tapping. The author's experience of pipes supplied by the best French founders did not justify this objection to the simpler and cheaper method of connecting services adopted in this country.

Only a small quantity of filtered river water (16 million gallons) was pumped into the potable water mains last year. The whole of this water was pumped in the month of December, no filtered water being used during the first eleven months of the year. The prejudice among the population against the use of any but so-called "spring" water for drinking purposes was very strong, and had been fostered by the attitude adopted by the Superior Council of Health of France in regard to filtration. There had been signs during the last three years of a modification

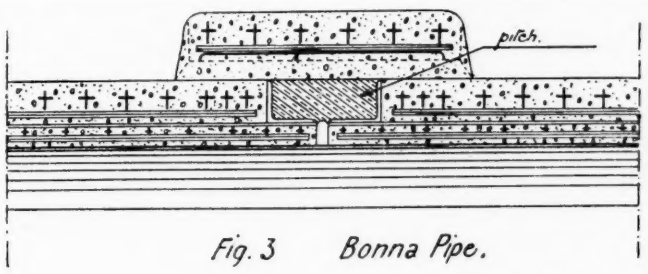


Fig. 3 Bonna Pipe.

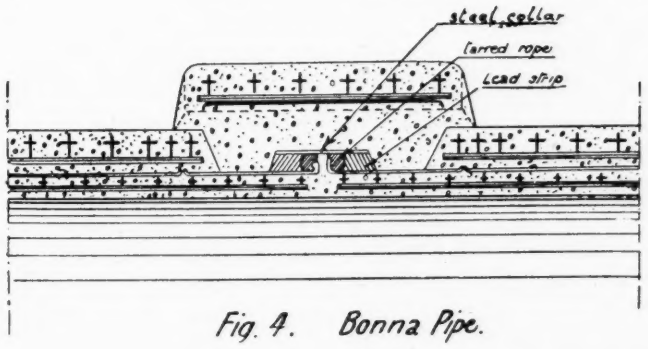


Fig. 4. Bonna Pipe.

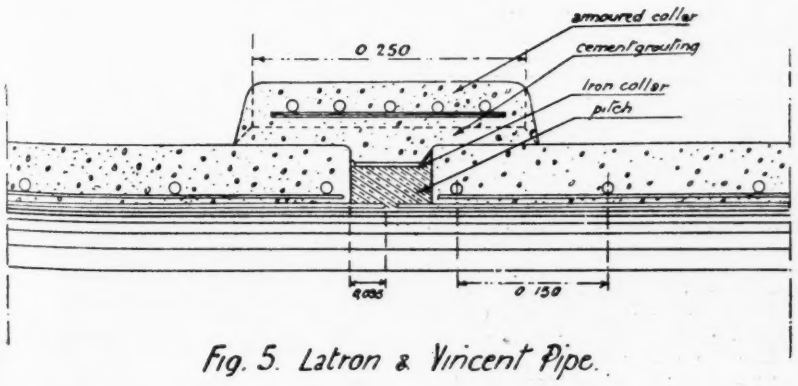


Fig. 5. Latron & Vincent Pipe.

of this attitude owing to the tardy recognition that the spring-water supply, which had been the pride of Paris for over half a century, was far from being of that good quality which its beautiful appearance and its supposed origin had led the Parisians to suppose. The serious epidemic of typhoid of 1902 was traced directly to the contamination of the waters of the Vanne, and the microbiological analyses of the aqueduct supplies generally showed them to be continually open to suspicion. In December last the bacteriological report of the Dhuis water was so unsatisfactory that the whole of its flow was diverted from the potable water mains. One of the principal "springs" of the Vanne had been entirely abandoned, while, as shown by the report of the Chief of the Water Department, some 2,000*l.* was spent last year on the sanitation of the "springs," closing swallow holes, diverting surface water, etc., on the Avre and the Vanne. The adoption by the Compagnie Générale des Eaux of sand filtration used in conjunction with the revolving purifier process of the late Sir William Anderson had demonstrated the fact that Seine water efficiently purified was the purest supply of water in the Paris region, as shown both by analysis and by the more convincing health statistics of the great suburban district supplied by that company for the last eleven years. It was, however, only with the view of providing a supplementary supply of potable water in case of a falling-off in the delivery of the aqueducts that the City authorities built filter-beds at Ivry and Saint-Maur in 1899, following the design of the Compagnie Générale des Eaux in the construction of sand filters, but omitting provision for the most important feature of that company's system of purification, viz., the Anderson purifiers. The Ivry filters were extended in 1906, and the gravel strainers of M. Puech adopted in conjunction with them. The exaggerated importance attached by the officials of the Montsouris Municipal Laboratory to the presence of even a single bacillus coli in filtered Seine water, although the "naturally pure water" conveyed by the aqueducts was seldom free from numbers of them, had led to the costly provision at Ivry of a duplicate series of pipes, by means of which the water could be filtered again should the first filtration fail to reach the official standard. At Saint-Maur the sand filters were mostly used for providing filtered water on which to experiment with the several systems of purification for the carrying out of which the City had voted a subsidy. The systems which they saw in operation at Saint-Maur were the De Frise and the Otto processes of sterilisation by ozone and Duyk-Howatson processes of sterilisation and filtration by "ferrochlore." The De Frise ozone plant is on a scale sufficient to treat approximately 6 million gallons per day. The ozone process can only be applied to water free from suspended matter. It had, however, a bleaching action, and appeared to change the typical apple-green tint of filtered Seine water to the blue colour characteristic of water drawn from chalk springs. There was a strong smell of ozone in the water immediately after treatment, but it was stated that this odour disappeared rapidly. The cost of the De Frise system was estimated at 0·56d. per 1,000 gallons, including interest and amortisation of capital outlay. No figures of cost were given for the Otto process. When applied to river water the cost of filtration must be added to that of ozonisation. The members of the Association also inspected the "ferrochlore" system of Messrs. Duyk & Howatson which consisted of the introduction into the water of a carefully proportioned mixture of chloride of lime and chloride of iron to form a coagulant, the water being then filtered through a mechanical filter.

The present situation of the water supply of Paris might be summed up as follows:—The Avre aqueduct was of sufficient section to carry 50 per cent. more water than it did at present. Fresh springs had been located and some already purchased. Several outbreaks of typhoid fever had, however, been traced directly to some of the springs in use, and the bacteriologists had declared that the spring water contained the bacillus coli.

A medical staff had been appointed by the authorities to watch over the health of the villagers dwelling near the springs, and any outbreak of disease was notified to the technical staff who endeavoured to obviate the pollution of the springs, in which work they were assisted by M. Marboutin with his method of testing by fluorescine. At the same time public prejudice against the use of river water, principally on account of its comparatively high temperature in summer, and the doubts of the Supreme Council of Health as to the efficiency of its filtration, had resulted in placing the filtering-stations in quarantine. The only practical remedy for this situation seemed to be the purification of the spring water either by ozonisation or by filtration. The spring water was so entirely free from solid or suspended matter that no film was formed on the filters, and experiments with ordinary sand filters showed that they were not capable of retaining the microbes to a sufficient extent. The introduction of a coagulant into the limpid spring water, on which Dr. Miguel made some experiments, promised good results, and the author believed that the spring water could be purified in the most economical way by this means. In the case of the water drawn from the chalk, a softening process would also most likely give excellent results from the point of view of purification.

The three pumping and filtering stations of the Compagnie Générale des Eaux at Choisy-le-Roi, Neuilly-sur-Seine, and Nogent-sur-Marne had been frequently enlarged since their inauguration in 1896, and now supply 43,000,000 gallons of water per day to a population of 900,000 persons inhabiting 131 communes surrounding Paris. The whole of this water was purified by the Anderson process. The author had followed with great interest the development of sand filtration for the supply of Paris and its suburbs since the time of the construction of the first sand filter on the banks of the Seine, with which he was associated. The waters of the Seine and the Marne were admirably suited for treatment by metallic iron. They contained sufficient lime to ensure under all conditions the formation in the purifiers of the protosalt of iron by the simple contact of the water and the metal, which was the first requirement for successful purification by this process. They were also free from an excess of dissolved organic matter of vegetable origin, which tended to hold the ferrous oxide in solution, and prevented its subsequent precipitation in the form of rust. French chemists attached comparatively little importance to chemical analysis, and did not make use of those delicate tests for free and albuminoid ammonia which were generally recognised in this country as the most valuable indication of the degree of contamination of sources of water supply. It had, however, been shown beyond question by a great number of analyses made in connexion with the iron process at Paris and elsewhere that the formation of ferric oxide, its coagulating action, and its presence in the film of a sand filter very greatly augmented the chemical purification afforded by ordinary sand filtration. While produced by the natural agency of carbonic acid and oxygen contained in the water and the air, the ferric oxide could be controlled and used artificially in the formation of the filtering film, so that the filter could be brought to a condition of maximum efficiency within a few hours of starting it to work. At the same time, its action in coagulating and fixing the finely-suspended matter in a coarse precipitate permitted of filtering at a rapid speed. The normal rate of filtration at the works of the Compagnie Générale Eaux was 88 gallons per square foot per twenty-four hours, increased occasionally to 100 gallons without impairing the efficiency of the filter. This meant that the addition of a battery of revolving purifiers to a plant of sand filters designed for the normal speed of 45 gallons per square foot doubled their filtering capacity, while, as experience showed, increasing their purifying efficiency.

The Compagnie Générale des Eaux had made extensive use of reinforced concrete in the construction of reservoirs and mains both in the neighbourhood of Paris and in other of their undertakings. The supply channels, settling tanks, and filter drains at the Choisy-le-Roi and Neuilly-sur-Marne works were of this construction. M. Chassin's firm had constructed for the company several reinforced concrete reservoirs of capacities ranging from 200 to 4,000 cubic metres, the largest being of circular form with a domed roof. M. Boutan stated that these reservoirs cost less than masonry, and had stood very well. Among the armoured concrete mains laid might be mentioned those supplying Venice, where there were about 3,000 yds. of 32-in. pipes made on the Monier system, and 7,000 yds. of the same diameter constructed by M. Bordenave on his "siderocement" system.

The specially interesting and novel feature of the works of the Compagnie des Eaux de la Banlieue was the plant of gravel strainers and sand filters on the system of M. Puech. The author's recent visit to Paris confirmed the view he expressed at Scarborough last year, that filtration in this case was overdone. The plant comprised three series of strainers, a "prefilter" or roughing sand filter, and a finishing slow-speed sand filter. Between each of the successive stages of straining and filtration the water was aerated in cascades, with the result that there was a luxuriant growth of vegetation. The clarifying efficiency of the gravel strainers and prefilters was so great that on issuing from the latter the water was perfectly clear. Practically, no film was formed on the surface of the finishing filters, but in the summer-time the water overlying the sand in these filters was full of growth floating at the surface or within 1 metre of its depth. An examination of this floating substance showed that it was decaying vegetable matter, and explained the fact that when seen through the colour tubes the water entering the reservoir was less brilliant in appearance than that issuing from the prefilters. Dr. Kemna showed that during the last stage of the process the water had deteriorated from the chemical point of view. In the author's opinion, M. Puech's theory is wrong in ignoring the value of the film formed on a sand filter. He looked upon the Puech strainers as extremely valuable for preliminary treatment of water containing much solid or suspended matter, and could not show his conviction as to its merit more practically than by saying that his company at Antwerp are now inviting tenders for the construction of gravel strainers at the Waelhem works.

On the motion of Mr. A. B. E. Blackburn, seconded by Mr. F. W. Hodson, a vote of thanks was passed to the author of the paper, and a discussion followed, in which Messrs. Bancroft (Hull), Wynne Roberts, Shaw, and Walker took part.

Underground Water.

Mr. Alfred B. E. Blackburn, B.Sc., A.M.Inst.C.E., then read a paper on "Underground Water—the Right of User in the Light of Recent Enactments." He explained the existing law on the subject and its inequity, and dealt with the protection of water supplies in recent enactments, amendment of the law, and allocation of underground water-bearing areas. In speaking of the amendment of the existing law, he said that a leading counsel some years ago said "the law of underground water as it now stands is simply silly." It was felt that Parliament should reasonably safeguard all water supplies authorised by them, and at the same time make provision for protection (*a*) to those who already had a water supply which might be affected by the powers granted, and (*b*) to those who had a natural claim to water from the same source. Parliament had, in the recent enactments referred to, recognised this principle, but at present this protection was only available to those authorities or persons to whom the particular private Acts applied. The question arose, therefore, was not an amendment of the general law desirable? Should not the Railways and Waterworks Clauses Acts be amended so as to embody this principle? This suggestion, however, at once raised the whole question of the allocation of underground water. The tendency in the past had been to treat the supplies of water of this country as if they were inexhaustible, and to allow any individual or group of individuals in any given locality to utilise them without reference to the effect of such utilisation on the community at large. There had been too little inquiry into the collective needs of the urban and rural inhabitants. It therefore seemed that the time had arrived when a comprehensive inquiry on scientific lines should be made into our underground

water resources, with a view to the substitution of some more equitable system of allocation for the present improvident and haphazard method of dealing with the matter. The gradual depletion of the total volume of underground water by reason of the growth of our towns and cities, and of improved land drainage (which reduced the quantity of rainfall percolating into the water-bearing strata), should have serious consideration. He maintained that, until a complete scientific survey had been made, and full statistics and information obtained as to the probable quantity of underground water in particular districts, including data as to its sources, levels, direction of flow, and other cognate matters, and until this information had been thoroughly analysed by qualified experts, it would be unwise to make any radical alteration in the existing law affecting underground water; but, in the meantime, the principle of protecting public and private interests on the lines already recognised by Parliament should certainly be made general in its application.

A vote of thanks having been accorded to the author of the paper, Mr. W. R. Baldwin-Wiseman. M.Sc., A.M.Inst.C.E., read a paper on "The Influence of the Thickness of the Pipe Wall on the Rate of Discharge of Water from Minute Orifices Piercing the Pipe."

This was the last communication presented to the meeting, and, the author having been thanked, the proceedings terminated.

THE HUDSON MEMORIAL BRIDGE, NEW YORK.

As MENTIONED in our "Note" of August 31, the Art Commission of New York wisely rejected the plans submitted for the proposed steel arch across the Harlem River owing to the unsatisfactory effect of the masonry pylons. Since then the engineers have entirely withdrawn their plans as a result of the reconsideration of details suggested by the Quebec Bridge failure.

The latest development is the submission of a design by the New York City Department of Bridges for a reinforced concrete bridge, with a total length of 2,840 ft. by 80 ft. wide, including a centre span of 710 ft. clear, with massive abutment piers and seven spans of 100 ft. each; three of these arches being on one side of the river and four on the other.

We give a sketch on this page which makes clear the general character of the design, which was prepared in outline by Professor W. H. Burr. The architectural treatment is due to Mr. Whitney Warren, and the structural details have been worked out by Mr. L. S. Moisseff, M.Am.Soc.C.E., of the Bridge Department.

The main span crosses the full width of the Harlem River and the lines of the New York Central Railroad, at the height of about 217 ft. above mean high water level. The bridge is designed with two decks, the upper one to carry a 50-ft. roadway and two 15-ft. pathways, and the lower one in an arcade to provide accommodation for four tramway tracks.

The main abutment piers of the central arch are hollow pylons of concrete faced with granite rising to the total height of 300 ft. above the river, the treatment of these architectural features being generally indicated in the view. The piers between the 100-ft. arches are of plainer character, and at each abutment there are grand stairways affording means of access between the bridge and the new public park which it is proposed to form as an extension of the present Riverside Drive. Part of this park is shown in the foreground of our sketch.

Apart from artistic considerations, the interest of the proposed structure centres mainly in the gigantic river span, the arch ring of which measures 725 ft. along the centre line and has the rise of 177 ft., the thickness of 15 ft. at the crown gradually increasing to 28 ft. at the springings, and the width of 70 ft.

Rising from the extrados of the ring are six rows of reinforced concrete columns, each 22 ft. wide by 8 ft. thick. The outer columns support spandrel arches upon which are longitudinal spandrel walls between the crown and abutments of the arch. The inner columns act as supporting piers for three series of arches above which are the main beams carrying the lower deck.

Extending upwards from that level are the arcades on either side, surmounted by the upper deck and cantilever footwalks.

Profesor Burr states that the arch structure is of the hinged type, which was adopted because this mode of construction definitely fixes the position of the equilibrium polygon at the joints, and so facilitates the computation of stresses.

It is also stated that the concrete is to be reinforced in such manner as to provide the necessary strength and stiffness, and so to avoid the additional load that would result in a plain concrete structure from large masses of material doing little or nothing in the way of resisting the working stresses.

We gather that the reinforcing members have been planned on a system very much akin to that in the McGraw building, New York, also designed by Professor Burr. The idea embodied is virtually that of a complete steel skeleton riveted up and embedded in concrete.

Although this type of reinforcement is contrary to what most specialists in reinforced concrete regard as strictly correct, there is clearly something to be said in its favour, and in the case of a monumental structure, such as the proposed Hudson Bridge, it would be taking an unnecessary risk to place absolute reliance upon the bond between concrete and steel, when an additional positive bond can be secured by connecting the members of the reinforcement by riveting.

From the following brief description our readers will be able to gather the main idea of the reinforcement proposed.

The arch ring will be reinforced by forty-eight 30-in. square rectangular steel ribs, each composed of four 8-in. angle-bars connected by lattice bracing. The ribs are to be arranged in four tiers of twelve ribs, all braced together by vertical and horizontal members. At each abutment three additional ribs are contemplated, and the entire skeleton will be constructed so that it can be erected on falsework as a complete arch before the concreting process is commenced.

The spandrel and other columns rising from the extrados of the arch ring consist of riveted steel stanchions 24 in. square, each built up of four 6-in. angle-bars with latticed bracing. These members are to be riveted at the bottom to the ribs of the arch ring and to transverse plate girders, thereby providing additional bracing for the arch ribs.

All the built-up members of the reinforcement will be filled with concrete, and after wards embedded completely in the same material.

If the project should be realised as it stands, the Hudson Memorial Bridge will differ materially from all reinforced concrete bridges hitherto designed, in the respect that a large proportion of steelwork will be employed simply for withstanding compression. Judging by published descriptions of the plans, there appears to be no risk of tension in the arch rings. Consequently, so far as these parts of the structure are concerned, it is questionable whether the work can be executed at anything like the cost of steel arches.

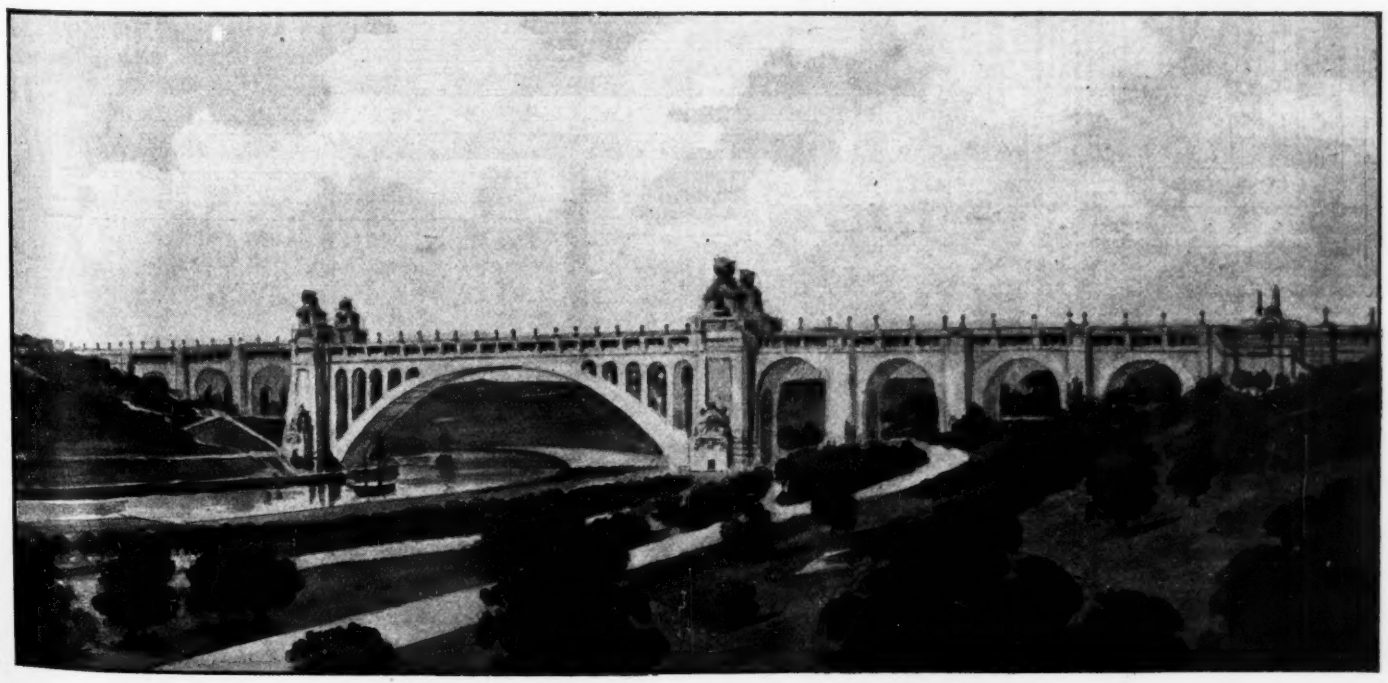
In the beams and decks, reinforced concrete could doubtless be used with much advantage, but Professor Burr's system of riveted skeleton reinforcement seems to preclude the possibility of economy.

Nevertheless, the very fact that so enormous an arch has been seriously put forward is an indication that the claim of reinforced concrete to be regarded as a suitable material of construction for the largest engineering structures will receive due recognition in the near future.

Illustrations.

"POLYHYMNIA": CARTOON OF DRAPED FIGURE.

THIS is a reproduction of the life-size "Cartoon of a draped Figure" for which the Royal Academy Silver Medal and prize of 25*l.* was awarded this year. Miss Margaret I. Dovaston is the artist.



Design for Hudson Memorial Bridge in Reinforced Concrete.

We remarked that the figure was rather a graceful than a sublime conception of Polyhymnia, but we gather that the artist is quite conscious of this, and intentionally adopted this view of the Muse. She remarks that "the authorities appear to disagree as to the exact inspiration which was properly derivable from this particular divinity," and, as the inscription on the margin indicates, she has adopted the view which regards Polyhymnia as the Muse who had the power of inspiring Singing and Rhetoric rather than the sublime hymn, and hence felt justified in putting more of rhythmic grace and action into the figure than a different view of her functions might have suggested.

This is a reasonable and consistent view; and of the grace of the figure there can at all events be no question.

Miss Dovaston, in addition to two other awards, has previously obtained the silver medal for the best set of drawings from the Life.

We must point out to Miss Dovaston, however, that the head of her figure is too small. In proportion the figure is, in fact, 8½ heads high; a proportion which is possible, perhaps, but entirely abnormal.

DESIGN FOR A COLLEGE CHAPEL.

THIS is the design which, as already mentioned in our columns, gained for its author, Mr. W. Harvey, the Gold Medal and 200*l.* Travelling Studentship of the Royal Academy this year.

The author sends us the following short statement of his intention in the design:—

"The design was prepared to comply with the instructions published to the students, viz.:—The size of the chapel 3,600 ft. super. within walls, height to roof plate at least 40 ft., ante-chapel and organ-screen in addition. No specific style was named in the instructions.

The scheme illustrated had for its basis the idea of producing an architectural effect of light and shade by means of the constructive forms necessary to support a domically-vaulted roof, the buttressing being included within walls to allow of a simpler elevation.

The glazing was designed to be near the external face of the walls to afford a spectator in the chapel as direct a view as possible of the coloured glass, suggested (though not designed) for the windows.

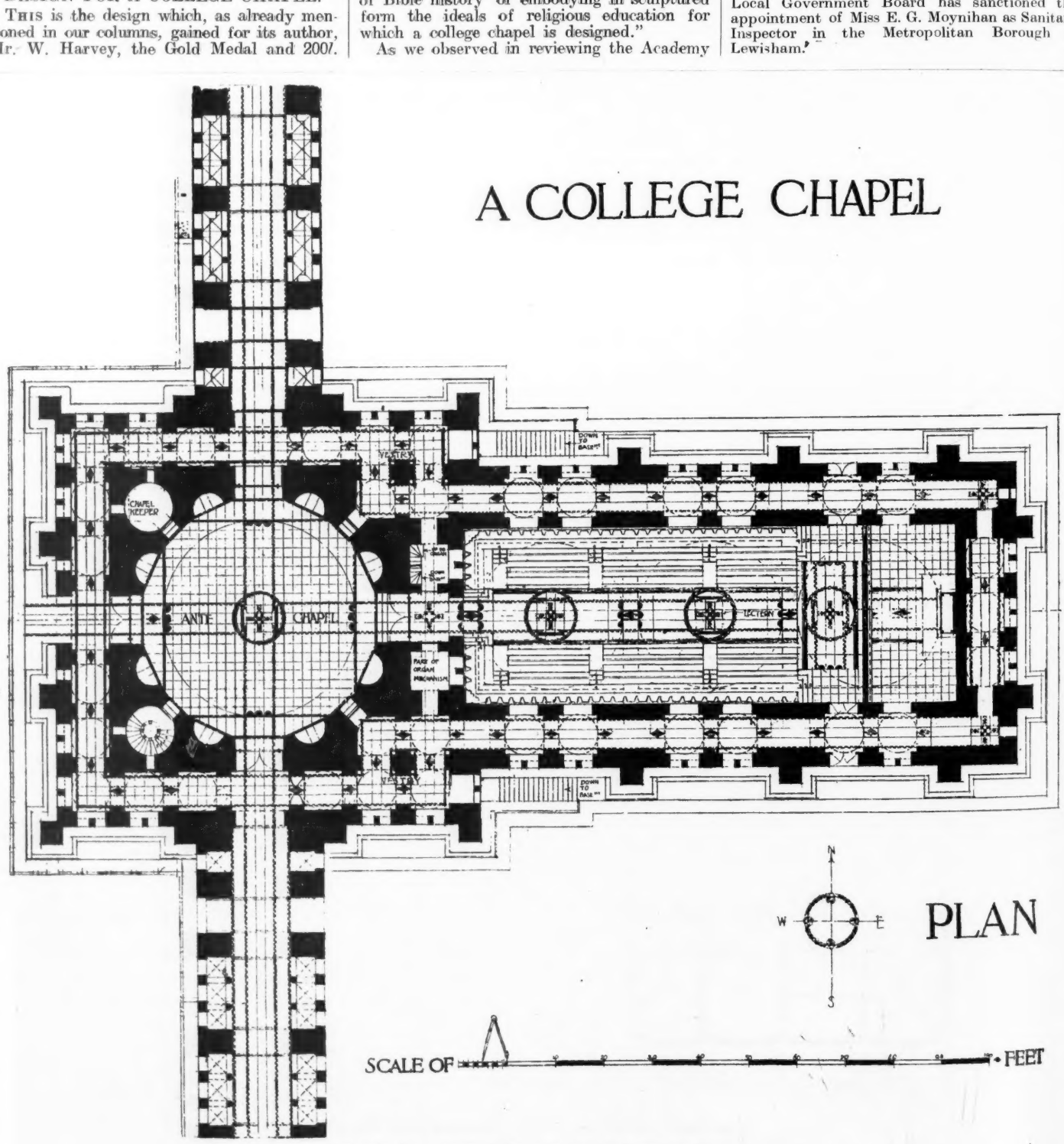
The imperishable materials, stone and bronze, have been suggested throughout the design, except in the stalls and organ, which were intentionally treated as furniture rather than architecture.

Statues in the round were indicated in the lower portions of the exterior, with the intention of aiding the expression of the building either by representing familiar characters of Bible history or embodying in sculptured form the ideals of religious education for which a college chapel is designed."

As we observed in reviewing the Academy Students' design, there was practically hardly anything to be called a competition for the medal, as only three designs were sent in, and the other two can hardly have been considered to be in the running at all; and it is certainly curious that a prize which is invested with the prestige attached to the name of the Royal Academy, and which in a pecuniary sense is the most valuable reward open in this country to architectural students, should attract so few competitors. The Soane Medallion of the Institute of Architects, which includes a Travelling Studentship of only 100*l.*, usually attracts some twelve to sixteen competitors or thereabouts; that the superior Academy prize attracts so few is certainly matter for reflection.

This fact, however, does not in any way detract from the merit of Mr. Harvey's design, which is one of the best gold medal designs we have seen of late years, and would have fully merited the prize even had it been the only design submitted. As we have already said, it does not in all respects answer our idea of a College Chapel; but as an architectural design it shows no little power and originality, and there is indeed a touch of genius in it, which gives promise of its author doing greater things in future.

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned the appointment of Miss E. G. Moynihan as Sanitary Inspector in the Metropolitan Borough of Lewisham.



Design for a College Chapel. By Mr. W. Harvey.
(Royal Academy Gold Medal. See separate plates in this issue.)

Fifty Years Ago.

FROM THE *Builder* OF DECEMBER 19, 1857.

THE STATE OF STAINED GLASS ART.

WE do not criticise a poem in favour or disfavour of the publisher, nor are poetic conceptions in architecture or sculpture attributed to the authorship of the mason or of the quarry masters of Carrara. In whose name, then, may most of our modern windows, good or bad, be fairly reviewed?

As matters of detail, there are other pernicious influences acting with deadening effect upon glass-painting, to which allusion may be made, namely, those which have resulted from the importation of German prints after Overbeck, Schnorr, Fürich, and others of the school. These engravings and lithographs, together with those after Rubens and even West, have formed the stock-in-trade of many of those practitioners who enjoy, under the present state of things, a positive reputation as "artists on glass." Sometimes, by a not unusual effrontery, a whole composition derived from such sources, and cruelly mangled in the ignorant rendering, may be seen as intact as the circumstances of the case would permit; at others, an attempt to cloak the clumsy theft by a torturing of figures by, say Fürich, into part compositions of Overbeck, etc., etc., may be easily detected; and then, worse than all, will come a few "make up" figures and accessories by the artist (?) himself. Thus has modern glass, in one of its most abject forms, been bolstered up and encouraged.

This is no exaggerated statement of the condition of stained-glass work in this nineteenth century of ours; but the evil, deep though it be, is not past cure. Let those to whom art is something, and who at once regret and deride its position in relation to glass who by their purse and influence [illegible] encourage it to better things, not [illegible] of its easy emancipation. Let them [illegible] matter deeper than they have yet do[illegible] seek the artist on glass as they wou[illegible] brethren of painting, architecture, or sculpture. Let them, in simple justice to those who devote to the art their best years and warmest studies, thus open the doors of truth to true authorship. Let all evidence of the miserable print plagiarism and trade system be sought out, as a wholesome preliminary in determining the choice of him who shall commit to future centuries a thing of beauty or a chromatic eyesore.

Pursuing such means, glass-painting will not long remain what it now is—a reproach to English art. Those few true men who are steadfastly devoted to it, will, under fairer encouragement, be joined in art-brotherhood by others who are now scared from the pursuit; and the present *trade* of glass-painting will give due place to the banished *art*, which has so long yearned for the day upon which the veil shall fall from the eyes of those who, with good intent, have sought it in darkness and in error.

*** It is gratifying to think that our prophecy of fifty years ago has to a considerable extent been realised, though there is still far too much of mere trade production in stained glass.—ED.

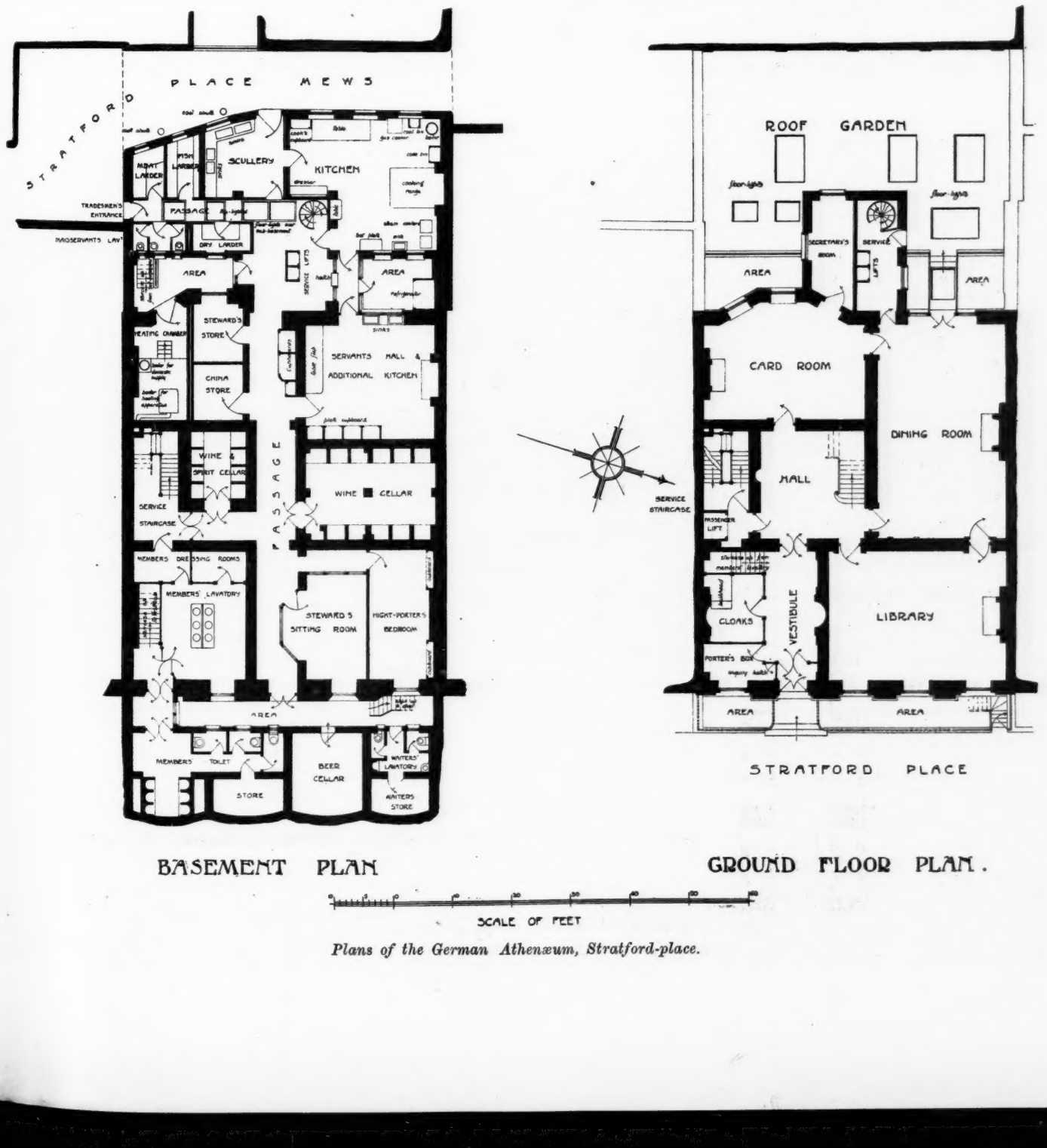
PLANS OF THE GERMAN ATHENÆUM CLUB, STRATFORD-PLACE.

THE German Athenæum Club, which was visited by the German Emperor on the 10th inst., and was founded in 1869 as a meeting-place for German merchants, artists, and scientists, moved a few weeks ago from its old premises in Mortimer-street, Regent-street, to 19, Stratford-place, Oxford-street, the opening ceremony being held on November 21.

The whole of Stratford-place was built by the brothers Adam about the year 1780—probably as a private speculation—and was named after Edward Stratford, second Earl of Aldborough. Part of it stands on the site occupied by the Lord Mayor's banqueting-house up till 1737, where the Lord Mayor and his Corporation used to dine annually after visiting the reservoirs in the neighbourhood. The street was formerly known as Conduit-mead. No. 19, which is the centre house on the western side, was originally occupied by Lord Malmesbury, and lately by Lord Ampthill.

In adapting the building to the purposes of a club extensive alterations and additions were necessary, such as the building of a service block, kitchen block, and sub-basement, the addition of a top story, and various works to suit the requirements of the London County Council, besides a complete rearrangement of the interior of the building. The architect, Mr. Lewis Solomon, has designed the new work as far as possible in keeping with the original, and wherever it has been possible the old work has been preserved, particularly the beautiful plaster decorative work on the main staircase and on the ceilings and friezes of the principal rooms, which latter still retain the original marble "Adam" mantelpieces.

The accommodation provided is as follows:—Library, card-room, two dining-rooms each 36 ft. long, committee-room, concert-room, and billiard-room, each of the two last occupying the full frontage of the house, 50 ft.; also twelve members' bedrooms and four bathrooms, secretary's room, steward's rooms, service-rooms, valets' rooms, and



Plans of the German Athenæum, Stratford-place.

maidservants' bedrooms and bathroom; and in the basement, kitchens, larders, scullery, members' lavatory, wine cellars, and various stores. In the sub-basement are the coal and beer cellars. The waiters are housed in an adjoining building at the rear of the site. Two hand-power lifts and Lamson pneumatic tubes have been installed in the service block, and an electric push-button passenger lift by Waygoods serves all the principal floors. Electric light has been installed throughout the building, and low-pressure heating apparatus in the public rooms and corridors.

A feature of the building is a new mosaic roof-garden, 50 ft. by 33 ft., at ground-floor level, over the kitchen block, the surrounding walls of which are decorated with trellis-work; a sun-blind can be drawn over this roof-garden. An elaborate oak platform, which can be reduced in depth or removed altogether when so required, as suggested by the chairman, Sir Edgar Speyer, has been constructed for the concert-room. The billiard-room has been decorated in fibrous plaster in a "light" classic style at the suggestion of another member, Sir Alma Tadema.

The decoration to the principal rooms and staircase has been carried out by Messrs. Cowtan, of Oxford-street, under the immediate supervision of the architect. The kitchen appliances and various iron staircases have been supplied by Messrs. Wilmer & Sons. The heating apparatus has been installed by Messrs. Wontner Smith & Gray. The general building contractors were Messrs. C. P. Roberts & Co., of Canonbury, and the clerk of works Mr. Sawyer. The contract amount exceeded 10,000*l*.

THE LONDON COUNTY COUNCIL.

THE last meeting of this Council before the Christmas recess was held on Tuesday in the County Hall, Spring-gardens, S.W., Mr. H. P. Harris, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to sanction the following proposals:—Sanction to the borrowing by Hampstead Borough Council of 8,155*l*. for electric lighting purposes, and sanction to the borrowing by Lambeth Borough Council of 10,000*l*. for the erection and equipment of municipal offices. It was also agreed to lend Poplar Guardians 12,700*l*. for poor law purposes, and 2,370*l*. to Wandsworth Guardians for the same purpose.

Valuation of Housing Sites.—A long discussion then took place on a report of the Finance Committee for rehousing operations.

Subletting.—In connexion with the proposed extension of the London County Council School of Building, Brixton, a list of tenders for which will be found in our last issue, p. 661, the Committee recommended:—

"That consent be given to E. Lawrance & Sons to sublet (i.) the constructional ironwork, and (ii.) the plumbers' work, to such persons or firms as may be approved by the architect, under the contract; that the Solicitor do prepare, and obtain execution of, the necessary agreement with E. Lawrance & Sons, prescribed by standing order No. B 248 relative to subletting; and that the Clerk of the Council do sign the agreement, when ready."

Mr. Dew moved, and Mr. H. R. Taylor seconded, that the words "and (ii.) the plumbers' work" be omitted, but after discussion the amendment was lost by one vote, and the Committee's recommendation was agreed to.

Training School and Secondary School Accommodation.—The Education Committee recommended, and it was agreed, that the estimate of expenditure on capital account of 15,000*l*., submitted by the Finance Committee, in respect of the acquisition of a site in North-west London, for the erection thereon of a training college for women teachers, to accommodate 150 resident and 100 day students, and a secondary school for girls, be approved.

Crosby Hall.—The Local Government, Records, and Museums Committee reported as follows in reference to this matter:—

"The Council will recollect that in the report above referred to we suggested that the directors of the bank might be prepared to rent the hall and surplus site, and that the sum so received could be utilised in the payment of the interest and sinking fund charges which the purchase would entail, but it seemed probable that such user by the bank would exclude that access to the hall by the public to which great importance has been attached throughout. We were unable at that time satisfactorily to meet that objection to our proposals. We have now, however, to report that, consequent on the discussion which took place when our report was considered by the Council on December 3, 1907, and, as the result of negotiations, we have ascertained that the Government, being anxious to co-operate in the movement for the preservation of Crosby Hall, would be prepared to consider a scheme under which the hall itself might be used for housing the commercial library of the Board of Trade, which the Board are anxious to utilise with greater profit to those commercial interests which are centred in the City of London. It has been subsequently ascertained that the Board would, in addition to using Crosby Hall itself, desire to obtain in the immediate vicinity other accommodation for purposes closely associated with those just mentioned. These negotiations found definite expression in a letter received from the Board of Trade on December 13, 1907. We feel that the action of the Board introduces a new and important element into the consideration of this question. A substantial tenant, presumably willing to take the property for an indefinite period, is assured, and under conditions which would give that access to the historic building which the Council and the public require.

We have also to report that the Lord Mayor convened a conference between representatives of the Council, the City Corporation, the Preservation Committee, and the National Trust for the Preservation of Historic Buildings, which conference was held on December 16, 1907. The Council's representatives did not at this conference feel justified in making any definite reference to the offer of the Government, feeling that the information should reach the Council before the statement became in any other way public property; but they stated that there was every prospect of securing a satisfactory tenant under conditions which they thought would commend themselves to the Corporation and other bodies concerned."

They recommended:—

"(*a*) That the resolution of December 3, 1907, with reference to Crosby Hall, be rescinded.

(*b*) That the Local Government, Records, and Museums Committee be authorised to ascertain whether the Corporation of the City of London will co-operate with the Council in securing the site of Crosby Hall, and whether the Crosby Hall Preservation Committee will obtain the consent of the subscribers to the preservation fund to transfer their subscriptions to the Council in order to assist in carrying out the scheme which may be hereafter agreed upon; that the Chartered Bank of India, Australia, and China be informed of the strong desire of the Council and the City Corporation to preserve the hall on behalf of the public and of the assistance which the President of the Board of Trade is prepared to render in the matter, and be invited to surrender their purchase of the whole or part of the site on suitable terms to be agreed upon; that the Local Government, Records, and Museums Committee be authorised to enter into such negotiations with the various authorities and persons concerned as may be necessary to provide a complete scheme for the preservation of the hall, and that the scheme shall not allow for any charge being made upon the rates, and shall be reported to the Finance Committee and submitted to the Council for its approval and sanction before the Council is committed to any action thereon."

Mr. Gray, in moving the adoption of the recommendation, said he was glad to be in a position to say that the Government were anxious to associate themselves with the Council and the City Corporation in order that Crosby Hall might be preserved to the public for ever. The Board of Trade had now informed the Committee that they were prepared to rent Crosby Hall from the Council, and also premises suitable for offices in close proximity to the hall. The intention of the Board of Trade was to house in Crosby Hall the commercial library of the Board, which was now housed in the vaults of the Foreign Office. They also propose to attach to the library the sample-rooms, which were at the present moment in Basinghall-street. The use of the new buildings for such a purpose would give immediate and permanent public access to the hall. He was, therefore, in a position to say that they were assured of a substantial tenant, who would pay a substantial rental, the exact amount of which he was not prepared at present to state. What the Committee now asked for was greater freedom than they were in at present with regard to carrying on negotiations, and for that purpose he asked that the resolution passed a fortnight ago should be rescinded. He trusted they might evolve a scheme which would be satisfactory to the City Corporation and the Government.

Mr. McKinnon Wood, M.P., congratulated the Committee upon the much more satisfactory report than had been the case a fortnight before. He was glad the Government had intervened, and on their side of the House they were all glad to recognise a prospect of saving Crosby Hall. The object to which they proposed to place the hall was obviously an admirable one, and one which was entirely congruous. He hoped there would be no hesitation in placing the Committee in a position to negotiate and bring to a successful issue their admirable efforts to save this ancient monument.

Mr. H. Lygon asked Mr. Gray whether his attention had been drawn to the state of the constructional timbers of the roof of Crosby Hall. Here was Mr. Gray asking for 60,000*l*., and yet he was totally unaware that the constructional timbers of the roof were permeated with dry rot. Before it voted, the Council was entitled to know how much it would cost to put the roof in a proper state of repair.

The recommendation to rescind the previous resolution of the Council of December 3 was carried.

On the second recommendation being submitted, Lord Midleton moved to add, after the words "Museums Committee," the words "in consultation with the chairman of the Finance Committee," and this was agreed to.

Mr. Hayes Fisher then moved to add, after the word "rates," the words "shall be conditional on the City Corporation being willing to co-operate in providing the purchase money."

Captain Swinton seconded the amendment.

The Council divided:—For the amendment, fifty-nine; against, forty-nine; majority for, ten.

The recommendation, as amended, was then adopted.

Subway Tramways from Strand to Victoria-embankment.—The Highways Committee recommended as follows:—

"That the estimate of expenditure on capital account of 9,240*l*., submitted by the Finance Committee, in respect of the construction on the underground conduit system of electric traction of the authorised tramways from the tramways under Aldwych, *viâ* the tramway subway, to those on the Victoria-embankment, be approved."

Old-street Improvement.—The Improvements Committee recommended that the estimate of expenditure on capital account of 3,000*l*., submitted by the Finance Committee in respect of the widening of Old-street at Nos. 316 to 322, be approved.

After discussion the recommendation was carried.

Middle Level Sewer, No. 2—Section B.—The Main Drainage Committee recommended as follows:—

"(*a*) That the operation of standing order No. B 167 be suspended in order to enable the Works Committee to submit, concurrently with the tenders received, an estimate of the cost of the work referred to in the following recommendation (*b*), and to enable the Council to consider such estimate concurrently with the tenders; (*b*) that an advertisement be issued inviting tenders for the construction of section B of the middle level sewer No. 2, and that the Works Committee do submit, for consideration concurrently with the tenders received, a sealed estimate of the cost of the work."

School, Battersea.—The Education Committee reported as follows:—

"In pursuance of our scheme for the structural improvement of six old schools during the financial year 1907-8, we have approved plans for the improvement of the Bolingbroke-road School (Battersea), one of the six schools selected. The school, which was built in the year 1873, provides accommodation for 1,040 children, and consists of a two-story building for the accommodation of boys and girls, the infants being accommodated in a separate one-story building. The revised accommodation of the school, on the completion of the improvements, will be for 333 boys, 325 girls, and 368 infants—total, 1,026; and the alterations will involve a loss of three places in the boys' department, a gain of one place in the girls' department, and a loss of twelve places in the infants' department. The cost of carrying out the scheme is estimated at 8,349*l*., which includes administration charges, and the cost of taking out and lithographing quantities estimated at 146*l*., but does not include the cost of any furniture which may be required. . . ."

They recommended accordingly, and the recommendation was agreed to.

Schools.—The following recommendations of the Education Committee were agreed to:—

"That the estimates of expenditure on capital account of 425*l*. and 125*l*. respectively, submitted by the Finance Committee, in respect of (i.) the acquisition of property adjoining the Pritchard's-road School (Bethnal Green, N.E.), for purposes in connexion with the scheme of improvements proposed to be effected at the school, and (ii.) the taking out and lithographing of quantities in connexion with the said scheme, be approved."

"That the estimate of expenditure on capital account of 140*l*., submitted by the Finance Committee, in respect of taking out and lithographing quantities in connexion with a scheme of structural improvements proposed to be effected at the Aldenham-street School (St. Pancras, E.), be approved."

"That the special estimate of expenditure on maintenance account of 440*l*., submitted by the Finance Committee, in respect of the transfer of an iron building from the Hazelbank-road site (Lewisham) and its re-erection on the Fowler-street site (Dulwich) for use as a dining-room, etc., in connexion with the special school, be approved."

Trade Scholarships.—The following recommendations were agreed to:—

"Twenty trade scholarships for boys tenable at the London County Council School of Building to be awarded on the same conditions as the London

County Council Shoreditch Technical Institute Scholarships.

Twenty trade scholarships for boys tenable at the Beaufoy Institute, to be awarded on the same conditions as the London County Council Shoreditch Technical Institute Scholarships.

Ten additional trade scholarships for boys tenable at the London County Council Central School of Arts and Crafts, to be awarded on the same conditions as the present trade scholarships.

Ten additional trade scholarships for boys tenable at the London County Council School of Engineering and Navigation, to be awarded on the same conditions as the present trade scholarships."

Acquisition of a Site for a School.—The Education Committee recommended as follows:—

"That the estimates of expenditure on capital account amounting to 20,216*l.* in respect of (i.) the acquisition of a site north of the Thames for a public elementary school to accommodate 840 children, as shown on the registered plan No. V. 63, and (ii.) the taking out and lithographing of quantities in connexion with the erection of the school, be approved."

The consideration of the matter was adjourned.

Improvements.—The following recommendation of the Improvements Committee were agreed to:—

"That the estimates of expenditure on capital account of 857*l.* and 623*l.*, submitted by the Finance Committee in respect of widenings of Fleet-street at Nos. 117 to 120 and at No. 46, be approved.

That the estimate of expenditure on capital account of 1,750*l.*, submitted by the Finance Committee, in respect of the widening of Farringdon-road near Rosebery-avenue, be approved."

Victoria-embankment Gardens—Site for Memorial to the late Sir Wilfrid Lawson, Bart.—The Parks and Open Spaces Committee recommended:—

"That the United Kingdom Alliance be allowed to erect a statue of the late Sir Wilfrid Lawson, Bart., in the Villiers-street section of the Victoria-embankment-gardens, on the site shown on the plan submitted, subject to the design of and inscription on the statue being approved by the Council and to all work incidental to the erection of the statue being carried out by and at the expense of the Alliance and to the satisfaction of the Council."

Captain Swinton moved as an amendment that another site be found for the statue—not out of disrespect to the late baronet, but from the æsthetic point of view.

The amendment was rejected, and the proposal agreed to.

Theatres, etc.—The Theatres and Music-halls Committee submitted the following proposals, which were agreed to:—

"Two new boilers installed at the Camberwell Empire, Denmark-hill (Messrs. Strode & Co.).

Certain alterations proposed to be made at the Camberwell Palace of Varieties, Denmark-hill (Mr. Lewen Sharp).

Certain alterations proposed to be made at the Grand Theatre, High-street, Islington (Messrs. F. Matcham & Co.).

Proposal to provide a pair of scenery doors on the o.p. side of the stage, and to form a public waiting-room by roofing over the yard at the o.p. side and at the rear of the stage at the Shepherd's Bush Empire, Shepherd's Bush Green (Messrs. F. Matcham & Co.).

Proposal to provide waiting-rooms in connexion with the stalls and pit at the Standard Theatre, Shoreditch High-street (Messrs. F. Matcham & Co.)."

After an all-night sitting, the Council adjourned for the Christmas recess.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Peckham.—That the Council do make no order with regard to the erection of an illuminated sign over the entrance-way to the Peckham Public Hall, on the western side of Rye-lane, Peckham (Mr. W. L. Dowton for the New Bioscope Company).—Agreed.

Hackney, Central.—Two houses on the northern side of Englefield-road, Hackney, eastward of No. 24 (Mr. R. J. Smellie for Mr. C. Culling).—Consent.

Hackney, South.—The erection of porches to Nos. 53, 55, 57, 59, 61, and 63, Gunton-road, Clapton (Mr. G. Osment).—Consent.

Islington, North.—Buildings at the workhouse, Hornsey-rise, Islington, to abut upon Sunnyside-road (Mr. F. J. Smith for the Guardians of the Poor of the parish of St. Leonard, Shoreditch).—Consent.

Lewisham.—Projecting porches to nine houses on the eastern side and twelve houses on the western side of Muirkirk-road, Lewisham (Messrs. Norfolk & Prior for Mr. F. Taylor).—Consent.

Lewisham.—Projecting porches to six houses on the western side of Muirkirk-road, Catford (Mr. C. Nicholas for Mr. W. Rolfe).—Consent.

Lewisham.—Bargeboards and porches to Nos. 2 to 50 (even numbers only) inclusive, Girton-road, Lewisham (Messrs. Eastman Brothers for the Building Estates and Property Association, Ltd.).—Consent.

Wandsworth.†—Houses on the northern side of Hazlewell-road, Putney, with the flank of one of such houses abutting upon the eastern side of Upper-park-fields (Mr. J. C. Radford for Mr. J. E. Davis).—Consent.

Wandsworth.—Three houses on the western side of Swaby-road, Wandsworth, one with a flank abutting upon the northern side of Littleton-street, and two with flanks abutting respectively upon the northern and southern sides of Waynflete-street (Messrs. Holloway Brothers).—Consent.

Fulham.—A projecting shop front at No. 77, Munster-road, Fulham (Mr. G. Roberts).—Refused.

Holborn.—An advertisement sign on the front wall of No. 1, New Oxford-street, Holborn (Mr. T. H. Pyke).—Refused.

Lewisham.—A porch and two lean-to additions in front of the Holy Cross Catholic Church, Sangley-road, Catford (the Rev. E. Escarguel).—Refused.

Southwark, West.—A projecting shop front in front of No. 25, Southwark-bridge-road, Southwark (Mr. W. W. Bingemann).—Refused.

Width of Way.

Bermondsey.—A building on the western side of Sun-street, Bermondsey, at less than the prescribed distance from the centre of the roadway of the street (Messrs. Barlow & Roberts).—Refused.

Width of Way and Lines of Frontage.

Brixton.—An addition to the store building at the rear of No. 298, Brixton-road, Brixton, to abut upon Thornton-street (Mr. H. P. Wyatt for Mr. J. W. Clark).—Consent.

Hampstead.—An addition in front of No. 7, Greville-place, Maida-vale, and also of an addition at the rear to abut upon Greville-road (Mr. J. J. Barclay).—Consent.

Lambeth, North.†—A warehouse building upon the site of Nos. 26 to 33, Hutton-road, Lambeth, abutting also upon Over-place (Mr. W. E. Clifton).—Consent.

Whitechapel.—A brick porch in front of St. Joseph's Schools and Girls' Home, Gun-street, Whitechapel (Mr. W. P. Ryan).—Consent.

Norwood.—Buildings on the western side of Brixton-hill, Brixton, to abut also upon the northern side of Cornwall-road (Messrs. Fasnacht & Beale for Mr. J. Wingrove).—Refused.

Lines of Frontage and Construction.

City of London.—The retention of an iron and glass covered way over London House-yard, City, connecting No. 79 and 80, St. Paul's-churchyard (Messrs. J. Spence & Co., Ltd.).—Consent.

Islington, East.†—A showcase on the forecourt of No. 36, Newington-green-road, Islington (Messrs. Paget & Son).—Consent.

Islington, North.—A showcase on the forecourt of No. 115, Stroud-green-road, Islington (Messrs. Brodrick Brothers).—Refused.

Width of Way, Line of Frontage, and Construction.

Kensington, South.—The retention of a wooden door-frame and doors in front of No. 2, Cranley-mews, Kensington (Mr. E. Hilland).—Consent.

Formation of Streets.

Norwood.—That an order be issued to Messrs. Fasnacht & Beale, sanctioning the formation or laying-out of a new street for carriage traffic to lead from Cornwall-road to St. Saviour's-road, Brixton (Mr. J. Wingrove).—Consent.

Norwood.†—That an order be issued to Messrs. Herring, Son, & Daw, sanctioning the formation or laying-out of new streets for carriage traffic out of Tulse-hill and Trinity-road, Norwood (Mr. E. Lloyd).—Consent.

Wandsworth.—Eight one-story buildings upon a site at the rear of Nos. 376 to 392, Garratt-lane, Wandsworth, and approached out of the south-eastern side of Summerley-street (Mr. S. Boothman).—Consent.

Wandsworth.—Permission to retain barriers across Ellerton-road, Wandsworth (Holloway Brothers).—Consent.

Space at Rear.

Dulwich.—A modification of the provisions of sect. 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building on the eastern side of Kinsale-road, Peckham, with an irregular open space at the rear (Messrs. Frampton & Sheffield).—Consent.

Marylebone, East.—A modification of the provisions of Part V. of the Act as to the extension above the diagonal line directed to be drawn by sect. 41 of that Act so far as relates to the erection of a block of flats upon a site between Nos. 11 and 13, Portland-place, St. Marylebone (Mr. F. T. Verity for Mr. L. Peczenik).—Consent.

Strand.—A modification of the provisions of Part V. of the Act as to the extension above the diagonal line directed to be drawn by sect. 41 of that Act so far as relates to the erection of an hotel building to be known as the Strand [Hotel, on the site of Exeter Hall, Strand (Mr. A. Salmon for the Strand Hotel, Ltd.).—Consent.

Uniting Buildings.

Kensington, South.—A glazed roof over the passage-way leading between Messrs. Ponting's premises from Kensington High-street to the District Railway Company's High-street, Kensington-station (Messrs. J. Barker & Co., Ltd.).—Refused.

Building for the Supply of Electricity.

Kensington, South.—A store and a workshop at the Richmond-road generating-station, Kensington (Mr. G. Neal for the Brompton and Kensington Electric Supply Co., Ltd.).—Consent.

Alteration of Building.

Islington, North.—A modification of the provisions of sects. 74 and 77 of the Act so far as relates to the uniting, on the ground floor, of Nos. 91 and 93, Seven Sisters-road with No. 95, Seven Sisters-road, and No. 165, Hornsey-road, Islington (Mr. J. Essex).—Consent.

Lewisham.—A modification of the provisions of sects. 74 and 77 of the Act so far as relates to the formation of an opening in the party-wall between Nos. 20 and 21, Empire-parade, Sydenham-road, Sydenham (Messrs. Eastman Brothers for the Building Estates and Property Association, Ltd.).—Refused.

The recommendations marked † are contrary to the views of the local authorities concerned.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

AT the fifth meeting of the Discussion Section of the Architectural Association, at 18, Tufton-street, on the 4th inst., Mr. K. Gammell in the chair, a paper was read by Mr. A. Needham Wilson on "Common-sense Design in Fireplaces."

He said that not very long ago the ordinary fireplace was designed to afford a minimum of heat and a maximum of blackleading. Those old cast-iron grates always interested him. The clever way in which they were arranged to convey all the heat up the chimney excited his admiration, and one had not even the poor compensation of artistic merit. Even if the ancient fireplace was extravagant and wasteful, and delivered more smoke than heat into the room, it and its surroundings were at least good to look at. But with the advance of "villadom" came the marble mantelpiece, leading to a rapid degeneration. The speculative builder seized upon the marble mantelpiece. They knew those marble mantelpieces, turned out by the thousand with real carved trusses, which always fell down and broke things. Then came the reaction. A real common-sense attempt was made to devise a better heating appliance. Some brilliant genius thought of tiles, and the cast-iron painted mantelpiece sprang into being and gladdened the Thames-street merchants.

In the terms of the title he had dwelt mostly upon common sense. Could this be made to cover the artistic side of the question? For art was not always common sense. But the fireplace was so essential a part of our daily life, winter or summer, that its appearance was as much a necessity as its utility. In winter the glow of the fire was the centre of attraction, and the mantelpiece a mere surround, in about the same ratio as the picture and its frame; but in summer we did not know what to do with our fireplace. He sometimes thought a fireplace should be so arranged that it will fold away or drop down out of sight when not required. There was something sad and dispiriting about an empty grate. How we enjoyed the gleam of our English open fire in the gloaming, and were quite contented to sit in any easy-chair and weave fancies from its glowing depths! Could they picture anyone looking at the glazed surface of a continental stove in the dusk and finding inspiration? For the same reason, no steam or hot-water heating apparatus would ever supplant the domestic open fire. If we put in radiators, we always had a fire too; not that it was really wanted, but it was something to look at. Fancy sitting round a radiator!

No; we must stick to our open fire, and let it offer us a field for common sense in design and arrangement.

Then we had come to look upon our open fire as an integral part in the ventilation of a room. He feared architects hardly realised what a very important part this was, for too often we arranged our fireplaces so that the only sitting-place was directly between

the door, window, and fireplace, to the utter discomfort of the householder and consequent anathemas on the architect. Dealing with the ventilation point, we adhered too strictly to traditional lines. The usual fireplace simply drew in cold air through door and window, whereas it should warm the fresh air discharged into the room, and in such a manner as not to drive the vitiated air down upon the occupants. It was very rare to find even an attempt to combine effective heating and ventilation by means of the fireplace, and yet surely this should be done. Further, no really satisfactory method for utilising the waste heat had come into anything like general use. In the best-designed grate, at least 25 per cent. of the heat escaped up the flue, and yet we left our comfortably-warmed sitting-room to retire at night into icy-cold bedrooms! Surely it should not be necessary to light a fire in a bedroom or to have a radiator when one had heat wasting below.

The avoidance of draughts, of course, gave rise to the ingle nook—one of the most pleasing features of fireplace design, and offering more scope for architectural treatment than the mere chimney breast. The ingle nook, too, had the advantage of affording more usable space in the room proper, for the domestic could serve the meals without tripping over the fender. It had the disadvantage that the fireplace could not always adequately warm the room. But in these days, when there was a passion for cottage simplicity and quaintness, the ingle nook was an excellent feature in the smaller house, and could often redeem the plain from the commonplace. He said the smaller house, because the ingle nook was somewhat out of place in the mansion with high rooms and more grandiose concomitants. It blended better with the low ceiling beams, warped elm doors, and such like. The projecting chimney breast was, he ventured to think, as often as not evidence of weak planning. Not only was it a wasteful encroachment on the room, but the angle of heat radiation was necessarily pushed forward unduly, so that the angles of the room escaped its effect. Of course, it was not always possible to set the fireplace flush with the face of the wall, but much might be done with the recesses to secure greater breadth of treatment. Did we not too often make the fireplace and mantel an isolated feature rather than a part of the general treatment of the room? Questions of expense must, of course, be a factor, but a simple treatment only was necessary to incorporate these recesses in the general treatment. What better place could be devised for your books, within arm's reach of your favourite chair, and cupboard for your tobacco jar and all your disreputable old pipes? These were too often relegated either to an article of furniture or else another isolated feature. Further, in cases where no ingle was possible, he suggested that these bookcases and cupboards should be movable wings, so hinged as to swing forward at will, to form the desired cosy corner. He had done this in one case, and he thought with success.

It was difficult sometimes to arrange fireplaces in an ideal manner, so that those sitting round were free from draught. For the mansion or public building they should use stone, marble, and elaboration of woodwork; but for the small house he advocated a simple breadth of treatment. Nothing looked better than a fireplace in as much expanse of surface as could be secured —a whitewashed wall, tiles, bricks, or what they would. The days of the fussy overmantel, with its many dust-traps in the shape of shelves, had happily gone. If a shelf there must be, let it be within reach, but the modern tendency was to dispose of the household gods elsewhere, and soon the mantelshelf would be as dead as the stop chamfer. There were many excellent forms of fireplace on the market, in which the metal-work was reduced to a minimum, and the grate devised on scientific principles to secure economy and efficiency at the same time. He himself preferred a simple hearth fire, the recess arranged on such a scientific principle that the angles of radiator were as acute as possible. Such a fireplace, if properly arranged, gave out a maximum of heat, and was most economical in operation.

To his mind no greater anachronism existed than the dog grate, as now used. It was all very well when its setting was a great, wide chimney back and a yawning opening above; but to set it in a square recess, picturesque and quaint though it be, simply courted waste of fuel. There were the cases, too, where one saw plate-glass stuck across the opening —a self-evident confession of failure. No deeply-recessed grate could be a successful heating apparatus, and, after all, that was the main consideration, and should be the starting point for the architect's design. The second consideration, he submitted, should be the reduction of cleaning to a minimum; the third, the omission of all unnecessary dust-traps; and the fourth, the common-sense use of materials.

Mr. Lishman opened the discussion and drew attention to some good cast-iron grates of the present day designed by well-known architects. He did not quite like the idea of hiding the fireplace altogether in the summer, and hoped no engineer would invent one to drop down out of sight, especially as in a climate like England you do not know how soon you may need a fire. A wood overmantel with tiles below on either side of the grate, and enclosed with a nice moulding, was about as satisfactory a treatment as could be, and there could be a shelf over about the height of one's shoulder. To the angle fireplace there was the objection that only three people could sit round it for comfort.

Mr. Pechell said the old hob fireplace had not been mentioned, and there was a good one in Lincoln's-inn Hall which answered well, but used much fuel. For heating bedrooms without fireplaces, a flue had been carried up to the bedroom, so as to bring in air warmed by the ground-floor fireplace.

Mr. Nicholson said it had been found out scientifically that the rays of heat from a coal fire, like sunlight, not only warmed the air, but extended to the wall surfaces of the room; but the obscure heat from hot air or water warms the air and leaves the walls cold and damp, and therefore the open fireplace seemed the common-sense method of heating.

A hearty vote of thanks was then accorded to Mr. Wilson.

Architectural Societies.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—On the 12th inst., in the General Lecture Room at the University, Dr. G. Wilkinson lectured upon some churches of Northern France, before the Sheffield Society of Architects and Surveyors; Mr. W. J. Hale presided in the unavoidable absence of the President. The lecturer began by referring to the chief characteristics of the design of the typical French as compared with the English churches. The most striking feature of the former was the greater height of the vault. To maintain the vault in its elevated position, a much more elaborate system of external buttressing was necessary, and also a wider spreading base, to which the thrust of the vault might be conducted. Thus the French examples had generally a greater width than the English. The greater width was obtained by adding to the number of the aisles, and at the east end by a semicircle of radiating chapels round the apse forming the chevet. The French ground plan shows less extension of parts, the churches are generally shorter, and there is less projection of the transepts, whilst eastern transepts and eastward projecting Lady chapels were distinctively English features. Spires or slender flèches were more frequent than groups of towers, which formed such a marked feature of many English cathedrals. The French western façade was always an important feature, usually occupied with beautiful examples of mediæval sculpture, in which branch of Gothic art France held the foremost place. The lecture was illustrated by a number of lantern slides prepared from the lecturer's photographs of Amiens, Rheims, Noyon, Soissons, and Laon. At the conclusion a vote of thanks was accorded on the proposition of Mr. C. B. Flockton, seconded by Mr. Horace Wilson, and supported by Messrs. H L. Paterson and J. R. Wigfull.

NORTHERN ARCHITECTURAL ASSOCIATION.—A lecture on "Early Christian Churches in Rome and Romanesque Churches in Northern and Central Italy" was delivered at 6, Higham-place, Newcastle, on the 11th inst., by Mr. C. S. Errington, A.R.I.B.A., the Hon. Secretary of the Association. By way of introduction the lecturer drew attention to the probable state of Rome at the time when the Christian religion became fully recognised by the State in the early fourth century, and proceeded to describe in detail some churches which were erected by the Emperor Constantine or by his orders, notably the old Basilica of St. Peter, and the churches of St. Paul and St. Lawrence, outside the walls of the city. As typical of the churches in Rome of later date, St. Clemente, St. Mary in Cosmedin, and St. Mary in Trastevere were described, and some interesting remarks made on the origin of the campanili or bell towers of these early churches. The lecturer afterwards dealt with the work of the Lombards and the influence of the Comacine Guild, a trained body of craftsmen to whom many architectural developments can be traced. The Romanesque churches of S. Ambrogio (Milan), St. Michele (Pavia), St. Miniato (Florence), and St. Zenone (Verona) were described as examples of the Xth to the XIIIth centuries, which are typical of the later development of the early church builders, special attention being given to the features which show Byzantine influence. In conclusion, the lecturer pleaded for a close study of these early examples of church building, and suggested that if architects were to be compelled to copy old examples the grand simplicity of this Romanesque and transitional period of Gothic would offer a variety on the later Gothic forms which have for so long had a monopoly. The lecture was illustrated by a numerous collection of lantern views, some of which were specially prepared by way of illustrating the various examples. Mr. A. B. Plummer, President, occupied the chair.

Engineering Societies.

JUNIOR INSTITUTION OF ENGINEERS.—At a recent meeting of this Institution, held at the Society of Arts, the Chairman, Mr. Frank R. Durham, presiding, a paper, entitled "Some Notes on Arc Lighting," by Mr. William Krause, was read and discussed. The author first compared the position of arc lighting of to-day with that of ten years ago, the special features of the open and enclosed types being pointed out. The development of the former was apparent from the increase in the number of lamps for public lighting; by the year 1907, out of 428 stations giving returns, 280 reported public arc lighting with a total of about 23,000 lamps. The open type was, however, now on the wane, and there were indications that it would eventually become quite obsolete. With reference to the enclosed type the author touched upon the various systems of control, and considered that for internal lighting that lamp would maintain its position for some time to come. The inverted arc system of reflection gave excellent illuminating results, but its cost, which was about 40 per cent. greater than that of direct lighting, limited its application. Dealing with the composition of carbons, the different effects produced in the colour of the light by the introduction of various salts and metals were described and consideration given to questions relating to the arrangement of the carbons. Comparisons of mean hemispherical candle-power of different types of lamps followed, after which some notes on flame arc lighting were given, and the paper concluded with a plea for the introduction of a two-colour light standard.

Competitions.

PROPOSED NEW CHURCH, GRINDLEFORD.—In this competition the designs of Mr. Ernest R. Sutton, F.R.I.B.A., have been placed first. The plans have been approved by the Building Committee, and an early start is anticipated. The total cost is estimated at 8,000*l*.

NEW COUNCIL OFFICES, RADCLIFFE.—The time for sending designs for these offices is extended to February 17.

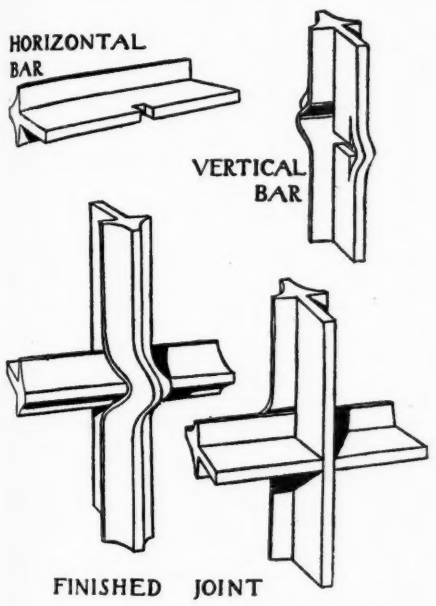
BOOKS RECEIVED.

NUNBURNHOLME AND ITS HISTORY. By the Rev. M. C. F. Morris. (Henry Frowde. 10s. 6d.)

THREE HUNDRED SHADES: AND HOW TO MIX THEM. By A. Desaint. (Scott Greenwood & Son. 21s.)

Trade Catalogues.

THE CRITTALL MANUFACTURING COMPANY send us a booklet on their "Fenestra" method of construction for metal sashes and casements. The special point of this lies in the arrangement for the jointing of bars at their crossing. Instead of mitre-ing, which cuts away a good deal of the metal and weakens it, a small cross slot is made in the vertical bar (only sufficiently large to allow the flange of the horizontal bar to pass through), the moulded portion is then pressed out so as to fold closely round the moulded portion of the horizontal bar. All that happens to the



The "Fenestra" Joint.

horizontal bar is that a small notch is made to act as a lock. From this it will be seen that the amount of metal removed in making a Fenestra joint is very slight. This allows a lighter section to be used than is possible with the mitre joint, thus making a saving in the weight of material used, and consequently in the ultimate cost of the sash. While noticing it, we must also say a word in praise of the artistic manner in which this booklet is produced. It is printed in a beautiful type, and illustrated with half-a-dozen line drawings of buildings in which the Fenestra sash has been used, which are excellent specimens of black-and-white work in pure line. The book was arranged and designed by Mr. Francis Crittall, and printed at the Chiswick Press. In an æsthetic sense it is a welcome contrast to the general run of trade advertisement books.

Messrs. Bastin & Co. send us a circular describing their improved "Elephant," which is made as an attachment for vertical spindle wood-working machines, as an independent elephant, or as a combined elephant and spindle machine. The apparatus is provided with a sliding table moved by hand screw, an adjustable swing arm, with rising and falling head whose position can be changed quickly by a lever or more slowly by screw and hand wheel. It is supplied with a square cutter block, French spindle and cutter, stair templet, cutter holder for rosettes, trenching cutter, straight and angle templet, and, when ordered, with stop chamfering and dovetailing attachments. These varieties of cutting tools and the fact that the spindle can be adjusted so that it can be used in any position suggest the great possibilities of the apparatus and its general utility to builders, carpenters, and joiners.

Correspondence.

"LAYING-OUT LONDON."

SIR,—It may be of interest to the readers of Mr. Paul Waterhouse's paper on "Laying out London" to know that the fact of the nearness of Westminster to the City through South London was appreciated over thirty years ago. A foreman of a firm of parcel-carriers used always to direct his carmen when going to Westminster from, say, St. Paul's to cross the river by Blackfriars Bridge and recross by Westminster in order to save time. I find that measurements on the small scale map you published last week (page 644) from Ludgate-circus to the Palace-yard favour the northern route by about 130 yds. This slight difference was more than compensated for by the freedom from the traffic even of that period.

Mr. Waterhouse's proposed road from Southwark Bridge to Westminster on the south side would be, of course, actually *shorter* than the route on the north side for parts of the City north and east of Southwark Bridge.

W. J. DAVIES.

THE BUILDING TRADE IN SAN FRANCISCO.

SIR,—As men connected with the building trades still continue to come over here, it has occurred to me that a few words, through the medium of your columns, upon the condition of affairs in this city, may be of value to others who may also contemplate coming to San Francisco.

Those who arrived here after the earthquake have done well and made money, but now many of these are beginning to find themselves out of employment.

For, although not one-third of the buildings that were destroyed by the fire have been rebuilt, yet the number of buildings in course of construction are decreasing.

Two minor reasons to account for this falling off have been—corrupt civic administration and labour troubles. But the most important factor is the growing scarcity of money, for the insurance money is rapidly becoming exhausted, whilst the banks, because of the universal tightness of money, are either unable or unwilling to advance loans.

The state of finance in this city is a reflection of that in the East; therefore, those at home who study the New York money market will be as competent as we are here to form an opinion as to the time when this city will be able to borrow money to complete its rehabilitation.

But until money can be borrowed at low rates of interest there will be no room for new arrivals in this city, for already far too many competent draughtsmen and skilled mechanics are idly walking the streets vainly looking for work.

FRANK H. PEARSE.

San Francisco, November 23.

PUBLIC ABATTOIRS.

SIR,—At the opening ceremony of the new slaughter-houses recently erected at Islington by the City Corporation, the Lord Mayor stated that "the Corporation were indifferent to the prospect of the houses being commercially remunerative," and the Chairman of the Cattle Market Committee also stated that "the Corporation did not expect the undertaking to prove remunerative."

After inspecting these buildings one can fully realise that the amount of dues for slaughtering cattle will not pay an interest on the capital expended, even under the able management of Mr. James King. May I, however, suggest that these remarks apply to the Islington buildings in particular, rather than to public slaughter-houses in general. Abattoirs well-planned and well-built, but without undue extravagance, should be either self-supporting or yield a profit, despite the fact that in England we have practically no powers to compulsorily close private slaughter-houses when a public one is built in the district, and, therefore, the private slaughter-houses remain in competition with them.

There are, however, very many public slaughter-houses in England which are financially successful. I have recently had occasion to ascertain from several local authorities in England whether their public slaughter-houses are a financial success or self-supporting. Fourteen replied in the affirmative; five that expenses were cleared with the exception of the amount for the repayment of loans and sinking fund; and eighteen in the negative. On the Continent public abattoirs are almost without exception profitable undertakings.

I think we are on the eve of abolishing private slaughter-houses, and erecting in their stead public abattoirs, a reform started by our Continental neighbours a century ago. The fact that they can and should be made self-supporting must be fully recognised, but to a large extent this depends on obtaining legislative powers to close the private slaughter-houses and supersede them by public institutions. That these are necessary on the ground of humanity and hygienic considerations has been admitted for many years.

R. STEPHEN AYLING, F.R.I.B.A.

ZODIAC ON GREEK COINAGE.

SIR,—The following emblems, apparently originating from the signs of the zodiac, appear on coins of cities beyond Greece proper. The zodiacal sign, corresponding to the emblem on the coin, is placed after it in brackets. The constellations referred to include the twelve zodiacal signs, and the thirty-six extra zodiacal signs or decans, connected with them. The coins, upon which these emblems appear, are described in Sotheby's "Sale Catalogue" of the Bunbury Collection, 1896, and the numbers refer to the lots:—

1. Coin of Lysimachus, king of Thrace. Silver tetradrachm, head of Herakles (Hercules), lion's skin (Leo), forepart of lion, crescent (Luna). Bunbury, lot 617.
2. Cyzicus. Horn of Ammon (Aries), star (Coma), bee. B., 618.
3. Lysimachia. Ammon horn, star, lion's head. B., 619.
4. Aenus. Horn, star, lion's head. B., 621.
5. Sigeum. Horn, star, lion's head, crescent. B., 621.
6. Ephesus. Horn, bee, crescent. B., 622.
7. Ephesus. Club (Hercules), corn ear (Spica in Virgo). B., 624.
8. Calchedon. Ear of corn. B., 633.
9. Heraclea. Club (Pollux), bow in quiver (Castor). B., 635.
10. Callatia. Ear of corn. B., 636.

Nos. 1 to 10 are silver tetradrachms of Lysimachus, king of Thrace, B.C. 323-281.

11. Macedonia. Club of Herakles, silver tetradrachm. B., 648.
12. Macedonia. Silver tetrobol. Prow (Argo). B., 653.
13. Macedonia. Bronze, club, serpent (Draco). B., 654.
14. Acanthus. Silver tetradrachm, B.C. 500-424, lion devouring bull (Taurus). B., 655.
15. Acanthus. Silver tetradrachm, lion, bull, fish (Piscis Australis). B., 657.
16. Edessa. Stater, B.C. 500-450, goat (Capricornus). B., 659.
17. Amphipolis, B.C. 424-358. Tripod (Ara), crab (Cancer). B., 660, 661.
18. Acanthus. Silver tetrobols. Forepart of bull, forepart of lion, goat, lion's scalp. B., 663.
19. Chalcidice. Silver tetradrachm, B.C. 392-379, lyre (Lyra), tripod. B., 664, 669.
20. Philippi. Hemidrachm, head of Herakles, tripod. B., 669.
21. Orrescii. Silver stater, circa B.C. 500, centaur (Centaurus). B., 675.
22. Neapolis. Silver stater, gorgon head (Perseus). B., 676.
23. Philippi. Gold stater, Philip II., Herakles, lion's skin, Phrygian cap, tripod. B., 679, 780.
24. Aenia. Bronze, bull, B., 681.
25. Amphaxus. Head of Herakles, club, bronze. B., 683.
26. Chalcidice. Bronze, lyre, tripod. B., 683.
27. Heraclea Sintica. Bronze, tripod, club. B., 683.
28. Pella. Bronze, bull feeding, bull standing. B., 683.
29. Philippi. Bronze, tripod. B., 683.
30. Mosses. Silver drachm, B.C., 540-480, warrior holding two spears (Duo Gœsa of Gemini. Waddilove: "Lamp in the Wilderness," 1847). B.C. 498-454, mounted warrior holding two spears, silver obol, forepart of wolf (Lynx), club, forepart of lion, head of Herakles, lion holding spear, forepart of lion. B., 685-687.
31. Alexander I., B.C. 498-454. Silver drachm, warrior holding two spears (Duo Gœsa). B., 688.
32. Amyntas III., B.C. 389-383. Silver stater, head of Herakles in lion skin. B., 691.
33. Amphipopols. Philip II. Silver staters, club, lion's skin, kantharos, pellet, crescent, grain of corn.

D. J.

COURT OF COMMON COUNCIL.

A MEETING of the Court of Common Council was held at the Guildhall on Thursday last week, the Lord Mayor presiding.

Disturbance of Human Remains.—On the recommendation of the Sanitary Committee it was agreed that advertisements be issued calling the attention of builders and other persons responsible for conducting building operations which are likely to involve the disturbance of human remains to sect. 25 of the Burial Act of 1857, and to the importance of at once giving notice to the Medical Officer of Health of all cases where human remains are found in the City.

Renewal of Skylights at the Central General Market.—It was agreed, on the recommendation of the Central Markets Committee, to accept the offer of Messrs. W. E. Rendle & Co. for the renewal of the skylights of the fish, fruit, and vegetable section of the Central General Market with their patent glazing, at the sum of 561*l.* 14s.

The Engineer's Staff.—The court discussed *in camera* a report on the subject of a rearrangement of the staff in the Engineer's office. The report recommended, *inter alia*, the appointment of Mr. J. G. Garthwaite as chief assistant to the Engineer, the payment of gratuities to certain clerks in the Public Health Department for extra work, and also the pensioning of several officials. The Court adopted the recommendation as to Mr. Garthwaite, but, on the motion of Mr. Deputy Turner, adjourned the consideration of the remainder of the report until the next Court, on the ground that the suggested annuities and grants were insufficient.

Obituary.

MR. DEW.—The death on Friday, December 6, is announced of Mr. W. A. Dew, aged fifty-six years, senior partner of the firm of Messrs. W. Dew & Son, of Bangor. Mr. Dew was a member of Council and Past-President of the Auctioneers' Institute, a Fellow during many years of the Surveyors' Institution, and secretary and treasurer of the North Wales Black Cattle Society. He was Mayor of Bangor in 1892, and as an estate agent and surveyor carried on an extensive practice in the Principality and the adjacent counties.

General Building News.

NEW CHURCH, HORNSEY.—A new Moravian church (Protestant Episcopal Free Church) is in course of erection in Priory-road, Hornsey. The new church is to cost, including the site, 5,000*l*. The architects are Messrs. W. D. Church & Son, of Finsbury, whose design was selected in competition, and the builders are Messrs. E. Tinsor & Son, of Kensington. The seating accommodation will be for about 400.

WESLEYAN CHURCH, SNETTISHAM.—The memorial-stones of a new Wesleyan church were recently laid at Snettisham. The building has been designed by Messrs. Gordon & Gunton, architects, of London, and the builders are Messrs. A. Lincoln. The contract price amounts to 1,100*l*.

CHURCH ENLARGEMENT, BEXHILL.—Additions are being made to the parish church at Bexhill from plans prepared by Mr. Walter Tapper, of London, and are now approaching completion. The south aisle has been extended westward, and a new north aisle built in the place of the existing one. A new organ-chamber has been built near the vestry. The ancient Norman arches, north and south of the tower, which had been practically closed, are being reopened and now lead into the north and south aisles respectively. The heating and ventilation of the whole church is also being overhauled. Messrs. Rudd & Sons are the builders.

WESLEYAN METHODIST CHURCH, ILLOGAN HIGHWAY.—A new Wesleyan Methodist church is being erected at Illogan Highway. Mr. Frank Mitchell, of Camborne, is carrying out the mason's part of the contract, and Mr. Moyle, of Chacewater, the carpentry and joinery, from the designs by Mr. Sampson Hill, architect, of Redruth. The estimated cost of the work is 2,057*l*.

CONGREGATIONAL CHURCH, LOUGHBOROUGH.—The Congregationalists of this town are erecting a new church at a cost of about 5,000*l*. The fabric is to be of red brick with stone dressings, and there will be an end gallery approached by a stone staircase from a vestibule which extends across the main frontage. There will be a choir recess at the rear of the rostrum, and accommodation is to be provided for between 500 and 600 worshippers. The choir and minister's vestries are placed behind the recess, and beyond these the Sunday-school buildings are to be erected. The architects are Messrs. Barrowcliff & Allcock, of Loughborough, and the contract has been placed with Messrs. W. Moss & Sons, Ltd.

TRURO CATHEDRAL.—The Truro Cathedral Building Committee have approved Mr. F. L. Pearson's slightly-modified design for the western towers and spires, and have also had under consideration his plans for the erection at some subsequent time of the Chapter House and other buildings in connexion with the cathedral. He has also prepared a plan for the cathedral school to be erected within the precincts. Arrangements have also been made for a peal of bells and suitable accommodation for the ringers in the north-west tower. It is likely that the bells will be shortly provided. The estimates for the towers are not yet quite ready, but will be considered at a subsequent meeting both of the Dean and Chapter and the committee. Mr. E. T. Price has been appointed clerk of works, and it is hoped that building operations will be commenced in the early part of next year.

CHURCH RESTORATION, SLALEY.—The restoration of the parish church at Slaley has been completed and the building reopened. Externally a porch, buttresses, cable crosses, spouting, and drainage have been carried out. Internally the gallery, plastered ceilings, decayed seating, and flooring have been removed. Messrs. Dinning & Cooke have supplied a new heating apparatus, and Messrs. Reed, Millican, & Co. have reglazed the whole of the windows. Mr. Robt. Beal, of Newcastle, has provided the new font, Messrs. Emley & Sons the mosaic pavement and marble step at the east end; Messrs. Robson & Sons have undertaken the communion kneelers and choir-seating, and Mr. Ralph Hedley the pulpit and chancel screen. The work has been carried out from the designs and details of Mr. A. B. Plummer, the Diocesan Architect, and the general contractor was Mr. John Civil, of Hexham.

NEW CHURCH, PENARTH.—The new St. Paul's Church at Penarth has just been opened. The building was originally a Wesleyan chapel, but was damaged by fire and afterwards sold, and has now been thoroughly renovated and converted into a church capable of seating 450 people, with school and club rooms to accommodate 500 children and adults. The contractor was Councillor William Jones, Mr. H. Snell being the architect.

PRESBYTERIAN CHURCH, REDLAND, BRISTOL.—The memorial-stone of Trinity Presbyterian church, Redland, has just been laid. The church is to be built with red Pennant stone and Bath stone dressings, both externally and internally, and will contain nave, transepts, aisles, chancel, minister's and choir vestries; the lecture hall, church parlour, classrooms, and caretaker's residence being already built. The corridors, passages, lavatories, and chancel will be laid with marble terazzo, and the chancel steps in white Sicilian marble. The floor of the church will be laid with pitch-pine blocks, the roofs covered with Broseley tiles; the whole of the internal fittings, including pews and doors, will be either of pitch-pine or oak. The roofs will be open timbered in pitch-pine, with hammer beam principals. The glazing throughout will be in tinted cathedral glass in lead. The heating arrangements for the church and subsidiary buildings will be by means of hot water low-pressure system, with pipes and raidators. The ventilation will be by Messrs. Boyle & Son's stystem. The church is to be lighted with the electric light, and will be seated to accommodate about 600 worshippers. The architects are Messrs. P. Munro & Son, Bristol; and Messrs. Wm. Cowlin & Son are the contractors.

METHODIST CHURCH, MATLOCK.—The opening has just taken place of the new Mount Tabor United Methodist church in Scarthin. The church has cost 2,000*l*., and has been constructed by Messrs. J. G. Walker & Sons, of Wirksworth, to plans by Messrs. J. Wills, of Derby.

PRIMITIVE METHODIST CHAPEL, SHERWOOD RISE.—A new Primitive Methodist chapel is being built on a site in Gladstone-street, Sherwood Rise, Nottingham. The building, which will have seating accommodation for 350 persons, is of red brick with stone facings. There will be a large tracery window in the centre of the front. The whole cost will be abou t2,500*l*. The architect is Mr. H. Harper, Mr. J. Lewin being the builder.

COUNCIL SCHOOL, NEW SAWLEY, DERBY.—A new Council school has been built at New Sawley from designs by Mr. G. H. Widdows, Architect and Surveyor to the Education Committee. The building will accommodate about 160 children.

FREE LIBRARY, HITHER GREEN.—The reading and magazine rooms of the newly-erected branch library at Hither Green are now open. The architect of the building is Mr. Henry Hopton, of Catford, whose design was selected in competition with twelve other architects, the builders being Messrs. Patman & Fotheringham, of Islington, and the clerk of works was Mr. Whorwell, of Catford. The terra-cotta employed in the work was supplied by Messrs. Doulton; the heating arrangements were by Messrs. Strode; the ornamental fibrous plaster work by Messrs. Bockbinder, of Kentish Town; the constructional ironwork by Messrs. Hawkins & Baxter; the iron and glass dome by the British Challenge Glazing Company, of Tooley-street; the ornamental glazing by Messrs. Morris & Son, of Kennington; the oak fittings and furniture by the Educational Supply Association; the granite flooring by Messrs. Diespeker, of Holborn Viaduct; the ornamental railings and gates by Messrs. Macfarlane, of Glasgow; the ventilation by Messrs. Wheeler, of Notting Hill; and the gas fittings by Mr. A. J. Hewens, of High-street, Lewisham. The cost of the work was about 4,500*l*.

NEW OPERATING-THEATRES AT THE ROYAL FREE HOSPITAL.—Two new operating-theatres have been built on the top of the north block of the Royal Free Hospital buildings in Gray's Inn-road. The work has been carried out under the direction of Mr. W. Harvey, architect, and Mr. Albion T. Snell, C.E.

BANK PREMISES, WREXHAM.—New premises have been erected for the Bank of Liverpool in High-street, Wrexham. The work has been carried out from the designs of Messrs. Grayson & Ould, of Liverpool, by Messrs. Morrison & Sons, of the same city. The clerk of the works was Mr. J. E. Tate, and the carving was done by Mr. E. O. Griffiths, Liverpool.

WEAVING SHED, PEMBERTON.—The Pemberton Manufacturing Company, Ltd., are erecting a new mill. The premises when complete will comprise a weaving shed, to hold 1,000 looms, with winding, warping, twisting, and slashing rooms, warehouses, offices, etc. The contractors are Messrs. Massey Bros., Pemberton, and the architect Mr. R. Pennington, of Wigan.

BUSINESS PREMISES, EXETER.—A new block of buildings, comprising shops, offices, and flats, is being erected on a site at the junction of Goldsmith and the High-street, Exeter. The external treatment is of brick with freestone dressings, crowned by a half-timbered story of oak and tiled roofs. Mr. James Crocker, architect, of Exeter, prepared the plans.

Foreign.

FRANCE.—The Municipality of Paris will take in hand shortly the works for the enlargement of the Hôpital Laënnec, in Rue de Sèvres.——There have been fresh thefts from the provincial art-museums. At Rouen four fine Limoges enamels, representing scenes from the Passion, have been abstracted from the art-museum. From that of Amiens five pictures have been stolen—one Van Loo, two Fragonards, and two Bouchers; also an important collection of curios and gold medals.——The dykes called "des Meules," on the Seine near Rouen, are to be reconstructed at a cost of 300,000 francs.——The Municipality of Orléans are about to institute a competition for designs for a new cattle-market, to include a large hall with an iron roof.——The Orléans Railway Company are about to enlarge the goods station at Ouzain (Loir et Cher), at a cost of half a million francs.——The jury in the competition opened at Angoulême for designs for a Bourse and a Chamber of Commerce have awarded the first premium to M. Geay, of Limoges.——The Société des Amis des Arts of Mâcon (recently founded) has organised an interesting local art-exhibition comprising about 400 works.——M. Libandière has been elected President, for 1908, of the Society of Architects of Nantes; and M. Antonin, architect, of Lyons, has been elected President of the Union Architecturale of Lyons.——The jury in the competition organised by the Consul-Général of the Seine for the artistic decoration of the Salle des Fêtes of the Commune of Lilas, have reserved for the final competition the designs of MM. Gorguet & Leroux, Tardieu, and Henri Marret, who will prepare detailed designs for the second competition, to be settled in June next.——The death is announced of M. Adolphe Coquet, architect, of Lyons; a member, since 1883, of the Société Centrale des Architectes.

GERMANY.—In order to improve the architecture in the suburbs, Graf V. Rödern, the Provincial Counsellor for Nieder-Barnin, suggests that the District Council shall invite architects to send in competitive designs for the style of house required; the successful designs to be purchased and offered gratis to contractors, who would reproduce the designs indefinitely. This is felt to be an unpractical suggestion, as no half measures can bring satisfactory results. The only way of ensuring success is to commission an architect to solve each problem as occasion arises.——The Berlin company, Terrain-Zentral, is offering four premiums, the first of 6,000 marks, for the best schemes for laying out the district of Stolpe, near Berlin. The district covers an area of 700 hectares (1,729·7 acres), planted with ancient pines, and possessing certain natural beauties which are to be taken into consideration in the schemes.——The late eminent mathematician, Dr. Paul Wolfskehl, has bequeathed a prize of 100,000 marks to whoever will prove the accuracy of Fermat's theorem. This undemonstrated problem affirms that while the sum of the square of two integers can equal the square of another integer (ex. $6^2 + 8^2 = 10^2$) the sum of the cube of two integers never equals the cube of another integer, and so on to higher powers. The XVIIth century mathematician, Pierre de Fermat, advanced this problem, and is said to have proved it, but the proof has been lost. For those who are interested in a matter which has baffled the greatest mathematicians up to the present we may announce that the proof should be sent in to the *Göttinger Gesellschaft der Wissenschaften*, who have the awarding of the prize.

AUSTRIA.—In 1906 the consumption of gas in Vienna amounted to 96¼ million cubic metres. At present this is provided by the gas works in Simmering and by two private gas works, which latter will become town property in 1911. A committee of inquiry has arrived at the conclusion that in that year the three works will not yield sufficient gas to meet the demand, and advises that a new municipal gas works be at once put in hand. The cost is estimated at 30,750,000 francs, and a sum of 5,750,000 francs would be required in the coming year to commence building operations.——Thirty designs were sent in for the competition for a Speckbach memorial to be erected in Innsbruck. The first prize was awarded to Herr Edmund Klotz, sculptor, of

Vienna.——For sixty years the Institute of Austrian Architects and Engineers has lost no opportunity of urging the formation of a Public Works Department. Gradually the fact has come to be acknowledged that public, like private, works require to be superintended, directed, and controlled from a centre, and an Office of Public Works is about to be built.——In the competition for the artistic decoration of a tavern attached to the Hotel Zum Kaiser von Oesterreich, Vienna, the first premium was awarded to Herr Franz Moro, architect, Vienna.——The *Journal of the Society of Austrian Architects and Engineers* publishes the following announcement concerning the exhibition to be held in connexion with the International Architectural Congress, Vienna :—

"Vienna, 1908. A. In response to the repeated wish expressed by foreigners, photographs will be permitted as supplementary exhibits, though it is particularly requested that when possible large pictures of decorative treatment be contributed. B. It is very desirable that an artist should supplement an exhibit by a book or portfolio containing an illustrated collection of his other executed works. C. The "special conditions" must in all cases agree with the "general conditions." D. May 4, 1908, is the date on which works of art must be delivered in Vienna at the K. K. Gartenbaugesellschaft, Parkring 12."

The Vienna Architects' Club were deterred by Schachner's death from sending up to the burgomaster a memorandum concerning Schachner's prize design for the Town Museum. The Plastic Art Club has since taken the matter up and forwarded the memorandum, which begs that no final decision be arrived at before some artistic body have been consulted on the subject.——Out of the 10,000 kilos of uranium which the Austrian Government presented to the Academy of Science, three grammes of radium have been extracted ; this is the largest quantity yet obtained. About one gramme of this is free of all impurities. The Academy proposes to loan a fragment to the English Professor W. Ramsay, in recognition of his services. The cost of producing the three grammes, apart from the value of the raw material, was 44,000 francs.——Amongst other subjects brought forward at the Fourteenth International Hygiene Congress, that of Caisson sickness (a complaint resulting from air-pressure) was discussed. The three speakers, Professor Langlois, of Paris, Drs. Schrötter and Silberstein, of Vienna, agreed as to the causes of the complaint, as well as to its prevention and cure. Most of the cases of sickness are due to the air pressure being too rapidly reduced, in consequence of which an excess of nitrogen is taken up by the blood. The obvious prevention is slower pumping. Other causes are traceable to foul air in the caisson, sudden changes of temperature, sudden variations of pressure, too long shifts, etc., all of which causes are preventable. In the Netherlands the Caisson Act of May, 1905, has dealt with these matters, and the results are of such importance that all civilised countries should take similar measures. The amount of air supplied per man per hour is regulated according to the pressure applied ; the length of the shifts varies from one and a half to eight hours, according to the pressure, and so on. The following results were obtained after the passing of the Act—from August 1, 1905, to July 4, 1906, sixteen caissons were sunk to a depth of 21 metres. Out of 164 persons who applied for work, thirty were rejected, and 125 out of the remainder had already worked in compressed air. One hundred and eight cases of distress were recorded among fifty-five men. Cases were not numerous during the pumping-in process, and were chiefly confined to slight earache, with occasional complaints of head and toothache. Ninety-eight instances of symptoms due to compression were observed, but these were merely pains in muscle and joint, and never resulted in disablement. The total number, 108, records every complaint reported, however slight, and does not include a single case of severe nature. Dutch legislators have thus succeeded in combating an illness hitherto considered unavoidable.

SWITZERLAND.—Of the eight competitive designs submitted for the St. Karli Bridge, Lucerne, that of Herr Pulfer, of Berne, has been selected. The bridge is to span the Reuss between Kreutzstutz and St. Karli, a width of 51·30 metres. The whole construction is to be of ferro-concrete. The fact that solid ground is found 3 metres below low-water level will simplify the construction of the foundations for the three arches.——The Municipality of St. Gall has voted 49,000 francs for an additional columbarium to the crematorium, which shall contain 778 niches.——The Senate of Canton Tessin passed a law on November 7 for the registration of engineers, architects, geometricians, and builders. In consequence, no one has the right to practice as an architect who has not graduated at a Realschule, and who does not hold the diploma of a polytechnic or a university.

SPAIN.—The enormous damage which the agriculture of Spain has suffered within the last few years, in consequence of continuous drought, occasioned the Royal decree of March 21, 1907, by which, in spite of the limited funds available, numerous projects for irrigating the country are without delay to be put in hand. The works will extend over thirty-four districts, whose total area amounts to 171,125 hectares, or 427,812 acres.——The Bank of Spain has commissioned an English firm with the production of a new issue of paper money. Great attention is to be paid to the decorative designs, which will represent specimens of famous Spanish architecture. The subjects selected for illustration are the Royal Palace at Madrid, designed by Juvara, and carried out by Sachetti, 1738-64 ; the Alcazar of Segovia, a noble building nearly 800 years old ; the Gothic Cathedral of Seville, built in the XVth century; the arch of Sta. Maria at Burgos ; and the Moorish Court of the Lions in the Alhambra, Granada.

BULGARIA.—Eight designs were submitted in the international competition for a University building in Sophia. The first premium (10,000 francs) was awarded to M. Breoson, of Paris ; the second (7,000 francs) to Messrs. Garçin & Bizet, of Geneva ; and the third (2,000 francs) to M. le Grand, of Paris.

Sanitary and Engineering News.

THINGOE RURAL DISTRICT.—Dr. St. George Mivart, in his Report to the Local Government Board on the sanitary circumstances and administration of the Thingoe Rural District, records that, speaking generally, the dwellings of the working class are in an extremely unsatisfactory condition. Some of the houses—and these not always the best—are of 9-in. brickwork, or of flints set in mortar with brickwork footings ; but by far the larger number are built either of "wattle and daub," *i.e.*, some kind of mud mixed with chopped straw and laid upon brickwork or laths, or they are constructed of some plaster material. Almost all the cottages inhabited by the poorest class are of this kind. Roofs are seen to be sinking in, and walls are bulging and overhanging to an extent that seemed dangerous in not a few instances. In one case a family was found living in a cottage the walls of which had had to be shored up to make them safe. Throughout the district cottage dwellings are in many instances going gradually to ruin. Many inhabited cottages are beyond repair and should undoubtedly be condemned as unfit for habitation. But the District Council has not, so far, taken action in this sense. In no village of the district is there any system of public water supply. So far as I could learn the District Council have not, at any time, caused any public well to be sunk or considered the advisability of so doing, even in places such as Brockley, Risby, Rede, Bardwell, and others, where of wholesome water there is at all times a scarcity, which amounts to famine in dry seasons. Throughout the district drinking water is obtained from wells, from water-courses, and even from ponds and ditches. In regard to excrement disposal vault privies are almost universal in Thingoe Rural District, and nuisances in connexion with them are rife ; in fact, the scarcity of privy accommodation is one of the few subjects about which there seems to be constant and bitter complaint. It appears that only in the rarest instances, and certainly only in connexion with better-class cottages, is there a separate privy to each house. Pail closets are in use in the district, but they are far from common. The sanitary authority does not anywhere undertake the emptying of privy pits or of pails, and there is no public removal of house refuse anywhere, though this duty in a few rare instances is undertaken by owners. The Report is one of the worst we have seen as to any district.

PROPOSED SEWERAGE SCHEME, HORSELL.—The Woking Urban District Council are making application to the Local Government Board for sanction to borrow a sum of 17,000*l.* for the purpose of carrying out a scheme of sewerage at Horsell. The scheme has been prepared by Mr. G. Wooldridge, Surveyor to the Council, and will provide for the drainage of all existing houses in the urban portion of the parish.

Miscellaneous.

THE CHRISTMAS HOLIDAYS.—Next week the *Builder* will be published on Tuesday, the 24th inst., and to ensure attention all communications for the Editor must reach our office by the first post on Monday, the 23rd.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. W. Flockhart, architect, has removed his offices from 180, New Bond-street, to 10, Conduit-street, W.——The partnership between Mr. E. A. Victor and Mr. Godard, architects, surveyors, and valuers, 5, Arlington-street, Piccadilly, is severed, and Mr. Victor will carry it on alone in future at the same address.——Messrs. Herring, Son, & Daw, auctioneers, surveyors, and valuers, have removed from No. 6, Ironmonger-lane, Cheapside, to 12, Old Jewry-chambers, E.C.

MR. RAFFLES DAVISON'S DRAWINGS.—Although the formal exhibition of Mr. Raffles Davison's sketches is closed, a number are still on view at the Modern Gallery, 61, New Bond-street, and may be seen on presentation of address card.

THE "Mechanical World" Pocket Diary for 1908 is the twenty-first annual issue of an extremely handy collection of engineering notes, rules, and data. In the present edition notes on electrical power transmission are not included, but in their place sundry items of fresh matter have been introduced, among which are tables giving particulars of British standard pipe threads and flanges, as well as tables and notes on subjects appealing more particularly to mechanical engineers. The section dealing with the resistance and deflection of beams has been improved by judicious revision. We should like to see in the next issue equally satisfactory treatment of struts and columns.

PETERBOROUGH CATHEDRAL. — The annual report of the Executive Committee for the restoration of Peterborough Cathedral, which has just been issued, records the completion of the work for securing the safety of the fabric commenced in 1883. The expenditure upon the fabric has amounted to 53,614*l.* 8s. 10d., and of this amount the sum of 57*l.* 10s. 10d. has still to be raised. In addition, the special gifts for adorning and beautifying the interior of the cathedral, including the choir floor and fittings, has, so far as can be ascertained, cost upwards of 20,000*l.* The committee return their grateful thanks to all who have contributed to raising these large sums, but add that there is still room for further effort in order that the interior of the building may be put in a satisfactory condition. A rood screen at the western entrance to the choir, they say, is desirable, and the flooring of the nave and other parts of the building require attention.

BUILDERS' EXCHANGE, BOLTON. — A new exchange for builders and those engaged in kindred trades has been established in this town. It is to be known as the Bolton Building Trades Exchange and Club, and the Bow-street Assembly Rooms have been rented, and are to be adapted as a centre. Mr. W. Grime is the chief spirit in the movement locally, and he is associated in the project with a number of prominent members of the Bolton building trade. At present the club is privately owned, but eventually it will probably be run by a committee of members.

HACKNEY BOROUGH COUNCIL AND ARCHITECTS' FEES.—The question of architects' fees on works not carried out forms the subject of a report by the Public Health Committee of Hackney Borough Council, issued on Monday. Messrs. Gordon & Gunton, architects, were engaged to prepare plans and specifications for the Urswick-road Dwellings Scheme, and the only negotiation with them as to fees took place at a meeting of the committee when, in reply to a question, they said they would charge 5 per cent. on the total cost of the buildings, everything complete. The original amount claimed was as follows :—Preparing plans and specifications—moiety of fees (1,020*l.*)—510*l.* ; preparing further set of plans in duplicate, and attending committee and sub-committee meetings, 31*l.* 10s. The architects visited blocks of model dwellings with the sub-committee and were instructed to prepare a plan providing for one-room tenements in the back basements. The estimated cost of the buildings was 19,941*l.*, and the architects' fees were 1,028*l.* 13s. Messrs. Gordon & Gunton claimed half this amount, as the scheme had not been proceeded with. The plans had to be altered to meet the requirements of the London County Council. The committee had endeavoured to obtain a reduction in the architects' charges. They were advised that the usual practice when plans and specifications had been prepared, and the buildings were not proceeded with, was for the architects to charge half the amount of commission agreed to be paid. Messrs. Gordon & Gunton had made out their bill on this basis, and had added a charge for the finished plans submitted to the London County Council, but they had now agreed, without prejudice, and with a view of meeting the Council as far as possible, to allow a reduction in their charges of 150*l.*, making the amount payable 391*l.* 10s. The committee had decided (subject to the usual sanction) that this sum be paid in full discharge of the claim.

MASTER BUILDERS AND THE SHEFFIELD CITY COUNCIL.—A letter published in the local press from the Master Builders' Association, emphatically protesting against the reflections as to their capability and honesty which were made during a recent Local Government Board inquiry at Sheffield, was the subject of a discussion at a meeting of the Sheffield Council on the 11th inst. Mr. C. H. Wilson, the Chairman of the Highways Committee, in referring to the matter, said he did not believe anyone said at the inquiry that the work could be done more cheaply by the Corporation if they simply took into account the cost of the work in the first instance. Probably the initial cost would be more, but the whole point was that it was done very much more effectually and satisfactorily. A contractor would

want to make as much as he could out of it, and he would not be so particular as the Corporation to see that the whole of the connexions were properly made and the work properly done. There were cases in which, after sewers had been down for only a portion of the period that they ought to last, they had been found entirely defective. That was after they had been down only fourteen or fifteen years, and it raised the question whether it was not really cheaper for the Corporation to do the work than to let it to a contractor. He made no general accusation against the members of the Builders' Association. He simply said that the Committee's experience was this, that sewers put in by contractors some few years ago were now found to be entirely unsatisfactory and defective, and that the Corporation ought to protect themselves against any recurrence of that kind of thing.—Alderman Styring remarked that the disclosures raised the question of how far supervision was effectively given by the City Surveyor or any member of his staff.—Sir Charles Skelton said it was difficult to prevent workmen from doing that which they ought not to do, however much the manufacturer or contractor tried to prevent this.—Alderman Uttley said it was easy to dupe the inspectors by arranging a system of signals which nobody else knew anything about.—Alderman Senior advocated a system of choosing certain contractors for work instead of advertising.—Mr. Neal expressed the opinion that it was folly to say in the argument that the men were not smart enough to catch them offending. As soon as supervision was started a little human nature crept in. The man tried to dupe the supervisor, and if he succeeded he thought he had done well. He did not believe that anyone would say that the Corporation ought to do sewering work by contract again.—At the close of the discussion, Mr. C. H. Wilson explained that at the inquiry nothing was said about Sheffield contractors.

EDINBURGH BUILDING TRADES' ASSOCIATION AND EXCHANGE.—The annual dinner of the Edinburgh, Leith, and District Building Trades' Association and the Edinburgh and District Building Trades' Exchange was held on the 12th inst. in the Royal British Hotel, Princes-street. Mr. Patrick Knox, President of the Association, presided over a company of about one hundred, among whom were Councillor Leishman, Edinburgh; Mr. James Somerville, President, and Mr. George Munro, Treasurer, of the Glasgow Master Plumbers' Association; Mr. George Anderson, President, and Mr. Rogerson, Vice-President, Glasgow Master Wrights' Association; Mr. William M'Neil, Vice-President, and Mr. Duncan Wilson, the Glasgow Master Masons' Association; Mr. H. O. Tarbolton, Edinburgh Architectural Association; Mr. James D. Gibson, Society of Ordained Surveyors; and the Secretary, Mr. James Cameron. Mr. George Anderson, Glasgow, in proposing the toast of the "Edinburgh, Leith, and District Building Trades' Association and the Building Trades' Exchange," said trade in Glasgow was really in a deplorable state. Instead of things being better, he thought that they were getting worse. Their experience was that the Conciliation Boards had not been at all satisfactory. Mr. James Millar, in replying, said he supposed they all knew that they had had pretty hard times lately in Edinburgh as well as in Glasgow. Every employer must be suffering to the very bottom of his pocket, and there was no change in the men's wages. They heard of the standard rate of wages not being paid in some cases. They as employers knew well enough that there was a great number of inefficient workmen in the building trade, and if an employer was going to keep a man who was inefficient, it was to be expected that the latter would take the money he was worth. In the building trade, however, there was very little breaking away from the standard rate of wages. Mr. James Clark also replied to the toast. The toast of "Kindred Associations" was proposed by Mr. Robert Lamb. Mr. James Somerville, Glasgow, and Mr. J. Philip Smith, of the House Factors' Association, replied. Councillor Leishman, replying on behalf of Edinburgh to the toast of the Corporations of Edinburgh and Leith (proposed by Mr. W. Paterson), said he thought they must look for some recovery from the somewhat depressing times they had been suffering from. In support of that belief, he found that there was an increase of no less than 31,000*l.* of the assessable rental of the city for the incoming year. Mr. Alexander Drysdale replied on behalf of Leith. The toast of "The Architects and Surveyors" was proposed by Mr. John Lownie, and acknowledged by Mr. H. O. Tarbolton and Mr. James D. Gibson.

SPRAGUE'S ARCHITECTS' POCKET-BOOK.—This useful little pocket-book duly makes its appearance for 1908. It contains, besides its complete paging for memoranda for every day of the year, a number of useful statistics as to iron-work; masonry; bricklayers' work; electrical work; weights of materials; foreign and English measurements compared, etc., etc. The tables and memoranda have been revised and corrected for this issue by Mr. F. R. Farrow, F.R.I.B.A., whose technical knowledge and acquirements are well known to our readers.

LEEDS MASTER BUILDERS AND THE CORPORATION WORKS DEPARTMENT.—A letter has just been published in the local press from the Leeds Master Builders' Association respecting the Corporation Works Department. In it are stated some of their objections to the continuance of a permanent and distinct Works Department and the growing practice of municipal trading. It appears that at a recent meeting of the Council a deputation stated that this was a "bread-and-butter question to the wage-earners of Leeds." This statement, the letter states, "is mere bluff, as wage-earners are not materially affected by the question as to whether the work is carried out by the Corporation or by contractors. The contractors of Leeds have entered into an arrangement with the operatives to pay the standard rate of wages and to observe approved conditions of labour, which are strictly complied with by our members. The Association have also conciliation arrangements with operatives' societies which will obviate strikes or lock-outs, whereas differences between the Corporation and their employees may become a menace to the industrial peace of Leeds. The deputation also stated that 'work can be better and more economically done by the Corporation than by the intervention of a middleman.' That this statement is contrary to fact is abundantly testified by the number of corporations who have tried Works Departments, and abandoned them after a fair and reasonable trial." Some comparisons of direct and private labour are given in support of this statement, and it is urged that "the sooner the Works Department is abolished the earlier will be the probability of doing away with a good deal of that extravagance which has caused such a heavy and grievous burden to fall upon the long-suffering ratepayers. Ratepayers should not be called upon to bear the cost of extravagant economic theories of irresponsible and reckless faddists."

BOLTON AND FARNWORTH BUILDING TRADES EMPLOYERS' ASSOCIATION.—The members of this Association recently held their annual dinner at the Pack Horse Hotel. The President (Mr. W. Townson) occupied the chair, and others present included Messrs. Frank Woods (Treasurer), G. Macfarlane (ex-President of the National Association of Building Trade Employers), Wm. Bullen (Vice-President of the Lancashire and Cheshire Building Trades Employers' Federation), and J. R. Vose (Secretary). Mr. J. H. Marsden proposed "The National Association of Building Trades Employers," and said it had been considered that the National Association had not done all the good it could, but nevertheless it had proved to be of service in the thirty years of its existence. The Association had secured the adoption of a form of contract which was fair to the builders, the architects, and their clients. They also formed in 1881 a Builders' Accident Insurance Company, and a national system of conciliation had been evolved. In replying, Mr. Macfarlane said Bolton had been in the back-wash of trade. He believed the high municipal rates were doing a great injury to the building industry of the present day; they were eating up the capital that ought to go in building, and men hesitated before they erected buildings, and had the heavy rates laid upon their shoulders. "The Bolton and Farnworth Federation of Building Trades' Employers" was submitted by Mr. Wm. Bullen, and the response was made by Mr. Townson, who said whilst no one would object to working-men receiving compensation for genuine accidents, the presence of disease might be a contributory cause, and in such cases compensation became a heavy and unfair tax on the employers, and the workmen themselves should pay their portion. Mr. B. Talbot proposed the "Lancashire and Cheshire Federation of Building Trades' Employers." Mr. F. Woods, who responded, said it was very necessary to strengthen the Federation, because they had already had notices of an advance in wages or alterations, and unless they were strong enough to resist any demands they might consider unfair, they would be saddled with additional costs before any boom in trade commenced. Referring to the Corporation new by-laws, he said architects and builders ought to be taken into consultation by authorities in the question of by-laws, which sometimes went far to throttle trade. Mr. Wm. Cunliffe, J.P., proposed "The Mayor and Corporation of Bolton and Local Governing Bodies," the Mayor replying. The remaining toasts were "The Building and General Trades of Bolton," proposed by Mr. W. Kay, and responded to by Mr. H. Mason; and "The President and Officials of the Bolton and Farnworth Association."

ROYAL SANITARY INSTITUTE.—The annual congress of the Royal Sanitary Institute is next year to be held at Cardiff. Dr. Walford, Medical Officer of Health for Cardiff, has been asked to take the position of local hon. secretary *pro tem.*, and a public meeting at which officers and a local committee will be appointed to make the arrangements for the congress is to be held shortly. At an examination in Sanitary Science as applied to buildings and public works, held in London on December 6 and 7, 1907, thirty-two candidates presented themselves, and the following eight were granted certificates:—E. W. Baldwin (Wimbledon); H. Beech (Manor Park); D. J. Brown (Cowes); S. G. M. Butler (Winchfield); A. E. Jones (Regent's Park); R. B. Ling (Battersea); S. R. Moss (Lincoln); F. Wilson (Enfield).

THE BLACKFRIARS BRIDGE ACCIDENT.—The inquest on the four men killed in the caisson accident at Blackfriars Bridge on November 28 has just been concluded by Dr. F. J. Waldo, the City Coroner, at his Court in Golden-lane, E.C. In summing up, the Coroner said that the five questions for the jury to decide were:—(1) How the four men, Irvine, Grant, Forster, and Cozens, directly or indirectly met with their deaths; (2) was the disaster purely accidental, or was it due to the neglect of any precautions in the structure or in the working of the necessary plan used in the widening of the bridge; (3) were the appliances, especially as regarded the jacks and girders, the best that the existing state of engineering science could provide in circumstances both of ordinary and extraordinary strain; (4) was the system of simultaneous control of the jacks in lowering and raising the caisson reasonably perfect; and (5) can any suggestion be made for guarding against similar mishaps in the future? The jury, after a lengthened consultation in private, replied to the questions as follows:—(1) Accidental death, in accordance with the medical evidence in each of the four cases. (2) Accidental and no negligence. (3) and (4) Yes. (5) We suggest that in the future the cock should be visible to the men working the jack and should not be covered with sacking. We further agree with the Coroner's suggestion that in the future the cock should be protected by a shield from above. We recommend that for the future each pair of girders should be converted into box girders. [Our comment on the result of the inquest appears under the heading of "Notes."

STRUCTURAL IMPROVEMENTS, HOUSE OF COMMONS.—Some rearrangements which are being effected during the recess involve the conversion of Committee-rooms 15 and 16 into one apartment, by the removal of the party-wall, for a new Grand Committee-room, and the refitting for the Commons' committee business of rooms 18 and 19 on the river-side corridor which have latterly served as writing-rooms for the Press. The reporting staff will, however, be reaccommodated in two large rooms upon the floor above, hitherto devoted to storage of parliamentary papers, with separate access from the Press-gallery to their new quarters by means of a new passage and a new direct entrance from the writing-out room.

Capital and Labour.

STATE OF THE BUILDING TRADES.—Employment in November was slack, and worse than a month ago and a year ago. Returns from 758 firms employing 44,648 workpeople at the end of November show that compared with a month ago there was a decrease of 4·6 per cent., and compared with a year ago a decrease of 7·0 per cent., in the total number of workpeople employed. In London the decrease amounted to 6·5 per cent. compared with October, and 15·9 per cent. compared with November, 1906. In the provinces the decrease was smaller, amounting to 3·8 per cent. compared with a month ago, and 2·6 per cent. compared with a year ago. The percentage of trade union carpenters and joiners unemployed at the end of November was 8·2, as compared with 7·1 a month ago and 6·9 a year ago; and for plumbers, for the same dates, 8·9, 8·3, and 6·9 respectively.—*Labour Gazette.*

Legal.

CASE UNDER THE LONDON BUILDING ACT.

IN a Divisional Court of King's Bench, consisting of Justices Channell, Bray, and Sutton, on the 18th inst., the hearing was concluded of the case of the London County Council *v.* The Coal Co-operative Society, Ltd., on the appeal of the London County Council from a decision of a Stipendiary upon an information preferred by Thos. Chilvers on behalf of the Council against the Coal Co-operative Society that the Society between February 12, 1906, and April 30, 1906, had, on the north-west side of Crystal Palace-parade, Camberwell, unlawfully erected in contravention of the provisions of Part III. of the London Building Act, 1894, a building beyond the general line of buildings on the north-west side of a street called Crystal Palace-parade, whereby they became liable to the penalty prescribed by sect. 200, subsect. 3 of the Act as amended by the London Building Act Amendment Act, 1898, and to have an order made against them to demolish the building or any part thereof.

It appeared that the respondents had erected the building in question as a coal order office, it

being a brick structure of one story, and about 15 ft. high from the pavement level, and was erected upon land leased to the respondents by the London, Chatham, and Dover Railway Company. Part of the land on which the building had been erected was acquired by the railway company under the Crystal Palace and South London Junction Railway Act, 1862, and in 1875 the undertaking of that railway company was transferred to the London, Chatham, and Dover Railway Company. On part of the land the railway company had laid down lines of rails and constructed the Crystal Palace high-level railway-station. The said land abutted on the Crystal Palace-parade, which was a street within the county of London, and separated from the footpath on the north-west side of Crystal Palace-parade by a boundary wall erected by the railway company; but the railway-station was erected at a distance of 26 ft. 7 in., and the lines of the railway were laid at a distance of about 35 ft. from the Crystal Palace-parade and on land 30 ft. below the level of the street. On March 24, 1906, the Superintendent Architect of Metropolitan Buildings, under sect. 22 of the Act of 1894, certified that the general line of buildings on the north-west side of Crystal Palace-parade between College-road and Farquhar-road, was, as shown by a pink line on the plan annexed to the certificate, and that the respondents' building was partly situate in Crystal Palace-parade and partly situate in Farquhar-road, and the certificate was confirmed by the Tribunal of Appeal. The respondents' building was erected wholly beyond the general line of buildings as certified by the Superintendent Architect, and the appellants had not consented to its erection beyond the general line of buildings in Crystal Palace-parade. The magistrate found as a fact that the land upon which the building was erected was land over which the railway company might exercise the powers conferred upon them by their special Act of Parliament for railway purposes, and that as the land was let and used for railway purposes he dismissed the summons. The question for the opinion of the court was whether the magistrate was right or not in so holding.

In the result their lordships (Mr. Justice Bray dissenting) allowed the appeal, holding that the respondents had failed to show that in what they did they were exercising some special power conferred upon them by some special Act.

Mr. Avory, K.C., and Mr. Bethune appeared for the appellants; and Mr. Macmorran and Mr. F. Mellor for the respondents.

BRICKLAYER'S CLAIM AGAINST BUILDING OWNER.

In the Court of Appeal, before Lord Halsbury, Sir Gorell Barnes, and Mr. Justice Bigham, on the 9th inst., the hearing was concluded of the case of Chapman *v.* Spencer (as receiver in lunacy of the estate of Mr. J. H. Burley) on the defendant's appeal from a judgment of Mr. Justice Walton.

In this case the plaintiff, a bricklayer of Leicester, brought the action against Mr. Burley, of Leamington Spa, to recover 465*l.* odd, the balance alleged to be due under a building contract for the erection of five shops in High-street and Cart's-lane, Leicester, and, Mr. Justice Walton giving judgment in favour of the plaintiff for the amount claimed, the defendant now appealed.

Mr. J. H. Hamilton, K.C., and Mr. Frank Dodd appeared for the appellant; and Mr. Montague Lush, K.C., and Mr. McCurdy for the respondent on the appeal.

Mr. Hamilton, in opening the case, said that the answer made by the defendant to the claim was that the building-owner, Mr. Burley, had paid every penny of it by handing cheques drawn in the plaintiff's favour to the architect under the contract, Mr. John Goodacre. What the plaintiff said was that payment to the architect was not payment to him, and therefore the issue was whether in the circumstances of the case the architect was the plaintiff's agent to receive payment, and if he was not had the plaintiff so conducted himself as to be estopped from saying that the architect was not his agent. The architect from the beginning to the end of the transaction wrote to the building-owner and sent him his certificate in favour of the plaintiff, and asked the building-owner to let him (the architect) have a cheque for the amount. The building-owner on each occasion sent the architect a cheque payable in favour of Chapman or order, and the architect sent back the certicate with a receipt which purported to bear the signature of Chapman. The cheque was subsequently paid, and the endorsement upon it and the signature on the receipt were both forgeries.

Lord Halsbury: What has become of the architect?

Mr. Hamilton: He attempted to commit suicide and was then placed under restraint on the certificates of the doctors. I do not know whether he is still under restraint, but he has never been sentenced.

The learned counsel went on to say that the plaintiff undertook to build shops for the building-owner in Leicester at a total cost of 3,990*l.*, but he was in fact only a bricklayer. He had tendered to the architect for the bricklaying work only, but had subsequently signed a contract which also specified the work to be done by other tradesmen at specified prices. He undertook the work without knowing anything at all about the tenders sent in by the other contractors and without having any communication with them at all. The plaintiff from time to time received payments from the architect, but appeared not to have been given any certificate. He received altogether in this way 600*l.* Subsequently plaintiff received another 150*l.* from the architect, and the architect gave him a bill for another 150*l.* Before that bill became due one of the other tradesmen to whom a balance was due applied direct to the building-owner, when the true state of affairs became apparent. Subsequently plaintiff brought the present action to recover not only the 150*l.* due to him, but the balance due under the other contracts. He (counsel) submitted that the plaintiff would not have gone through a course of business like that unless either he had no real contract with Mr. Burley except as to the bricklayer's work, or unless he constituted the architect his agent to carry out the whole of the work for him except the bricklaying work, which he could do himself. In the first place, the plaintiff had disregarded the formality of asking for certificates for his own part of the work, the bricklaying, as payments became due, although he must have known that the architect was receiving payments from the building-owner. Secondly, he did not insist upon full payment as he became entitled to the money, and in the end when the brickwork was completed he allowed twelve months to go by before he received the balance, and he then accepted two bills, one of which was afterwards dishonoured. In the third place, he made no inquiries as to what the sub-contractors were being paid, but left it to the architect to settle with them.

Lord Halsbury said that the difficulty in the way of Mr. Hamilton was that Mr. Burley sent the money direct to the architect, and yet it was sought to be said that Mr. Burley's mind was so affected by what the plaintiff did that he was put in a different position.

Mr. Hamilton submitted it was clear that the plaintiff constituted the architect his agent not only to receive the money from time to time, but to pay it away, and therefore, if the architect got money for which he never accounted and never intended to account, the plaintiff was the person to suffer from the dishonesty of the man who was his agent.

Mr. Dodd having followed on the same side,

Lord Halsbury, without calling upon counsel for the respondent, in giving judgment, said it was one of those cases in which two innocent persons had been placed in a false position by reason of the frauds of a third. So far from the architect being treated as the agent of the plaintiff for receiving the money, he thought he was treated in one sense by Mr. Burley himself as the person to pay the money to, and in order to make certain that the money would reach the plaintiff he paid it by cheques drawn in the plaintiff's favour. He could not see that there was any liability on the part of the plaintiff, and thought the decision of Mr. Justice Walton was right, and should be affirmed.

Sir Gorell Barnes and Mr. Justice Bigham being of the same opinion, the appeal was accordingly dismissed with costs.

SAWYER'S CLAIM UNDER THE WORKMEN'S COMPENSATION ACT.

In the Court of Appeal, before the Master of the Rolls and Lords Justices Moulton and Farwell, on the 13th inst., the hearing was concluded of the case of Liddle *v.* Robson, Miller, & Co., on the appeal of the applicant from the award of Judge Greenwell, at the Newcastle County Court, sitting as Arbitrator under the provisions of the Workmen's Compensation Act, 1897.

It appeared that the applicant, William Liddle, a lad, was at the time of the accident in the employ of the respondents, the owners of certain sawmills. Liddle was employed by the respondents as a sawyer, and was admittedly seriously injured when he went down into the pit, it was alleged, by the order of one of the general labourers who had asked him to assist in filling the bags with the sawdust. The learned County Court judge held that the applicant was not entitled to compensation under the Act as the accident had not arisen out of or in the course of his employment, he having disobeyed orders by going into the saw-pit. The applicant now appealed on the ground that there was no evidence before the County Court judge which justified him in holding that the accident did not arise out of or in the course of the employment.

The case came before the Court of Appeal two or three weeks ago, when the Master of the Rolls directed that it should stand over to enable the learned County Court judge to communicate with the Court, stating the reasons for his finding of fact.

The Master of the Rolls now informed Mr. Macpherson that he had heard from the learned County Court judge, who had given his reasons for the decision he had arrived at.

Mr. Macpherson submitted that there was no evidence to support the finding of fact of the learned County Court judge, and that he had misdirected himself.

Their lordships, without calling upon counsel for the respondents, held that there was evidence to support the finding of fact of the learned County Court judge, and dismissed the appeal with costs.

CASE UNDER THE PUBLIC HEALTH ACTS.

The case of the Bromley Corporation *v.* Cheshire came before a Divisional Court of King's Bench, consisting of Justices Channell, Bray, and Sutton, on the 17th inst., on the appeal of the Corporation from a decision of the justices upon a complaint preferred against the respondent under the provisions of the Public Health Acts, 1875 and 1890.

Mr. Morton Smith appeared for the appellants; and the respondent was not represented.

Mr. Morton Smith said that the case came before the Court in the form of a special case which had been stated by the justices, and the question for decision was whether the justices were right or not in refusing to make an order on the respondent for his proportion of the cost of relaying a certain single private drain. The short facts of the case were these:—The respondent was the owner of a house known as No. 4, Tweedie-road, Bromley, the drainage of which was carried into the public sewer through a single private drain. The occupier of No. 2 by a letter complained of a nuisance, and the appellants sent an inspector, who, having examined and applied the smoke test, discovered a defect in the drain, and notice was given to the respondent to remedy same. The respondent not carrying out the work, the Corporation executed it and relayed the drain, the cost of which they took the proceedings before the justices to recover. The justices held that, because the Corporation had not given the occupier the statutory twenty-four hours' notice of their intention to open up the drain, the respondent was not liable to pay the cost of relaying it.

Mr. Justice Channell: Is there any question of this being a drain or a sewer?

Mr. Morton Smith: No; it is admitted that it is a single private drain.

Proceeding, the learned counsel said the Act of Parliament required that where a notice was received that a drain was defective the local authority were entitled to empower their inspector to go and examine the drain on the premises where it was supposed to be defective. Upon the inspector examining the drain and finding it defective, the local authority could give notice to the person who was liable to repair it, and failing his doing so the local authority could themselves do the repairs and make a charge for the work. He contended that the Corporation had acted properly in the matter, and that the justices were wrong in having dismissed the complaint.

In the result their lordships held that the notice in question was not a condition precedent to the right of the appellants to recover the amount claimed by them from the respondent, and remitted the case to the justices with that direction.

The appeal was accordingly allowed.

CASE UNDER THE HIGHWAY ACT.

The case of the King *v.* the Justices of Surrey (*ex parte* Locke-King) came before a Divisional Court of King's Bench, consisting of Justices Channell, Bray, and Sutton, on the 13th inst., for argument on a rule *nisi* for a mandamus directed to the Surrey Justices commanding them at the next Quarter Sessions to enrol a certificate dated May 11 last stopping up and diverting a highway in the parishes of Byfleet and Chertsey leading from Green-lane, in the parish of Byfleet, to a certain point in the parish of Chertsey, where it crossed the main line of the London and South-Western Railway, and to make an order for stopping up and diverting the highway.

The facts of the case were shortly these The applicant, Mr. H. F. Locke-King, under sect. 84 of the Highways Act, 1835, served the requisite notices on February 16 last, requiring the Chertsey Urban District Council and the Chertsey Rural District Council, as surveyors of highways for the parishes of Chertsey and Byfleet, to apply to two justices to view the old and proposed new highways, and to give the necessary statutory directions. The District Councils subsequently passed resolutions agreeing to the diversion. On March 6, 1907, the Byfleet Parish Council passed a resolution agreeing to the stopping up and diversion of the highway. On March 18, 1907, public notice was given that the resolution had been passed and would

be confirmed at a meeting of the Council subsequently to be held. On March 21, 1907, the consent of the applicant and of the railway company over a portion of whose property the proposed new highway was to run, were obtained. On April 6, 1907, two justices having viewed the old and proposed new highways, instructed the District Councils to affix the proper notices as directed under the Highway Act, 1835. On March, 11, 1907, the two justices gave their certificate, with the plan showing the old and proposed new highways annexed. On June 4, 1907, the resolution of the Byfleet Parish Council was duly confirmed. On July 2, 1907, application was made at Quarter Sessions to enrol the certificate and for the usual order under the Act of 1835. Upon that application the Clerk of the Peace informed the justices that the consent of the Parish Council was a condition precedent to the view by the justices and to the giving of their certificate. The justices at Quarter Sessions, upon that ground, and also because the plan delivered to them did not properly describe the old and proposed new highways as required by sect. 85 of the Act of 1835, refused the application, and the rule *nisi* for a mandamus was obtained.

In the result their lordships held that the justices at Quarter Sessions were justified in what they had done, and that they would have been wrong if they had decided otherwise.

The rule was accordingly discharged.

Mr. Horace Avory, K.C., and Mr. E. Jelf appeared to show cause against the rule; and Mr. Macmorran, K.C., and Mr. Guy Lushington supported it.

DAMAGE TO PROPERTY BY SUBSIDENCE.

IN the Court of Appeal, before the Master of the Rolls and Lords Justices Moulton and Farwell, on the 16th inst., the hearing of the arguments of counsel was concluded in the case of Forster and others *v.* The Elvert Colliery Co., Ltd., and others, on the appeal of the defendants, A. B. Dyson, F. E. Crawford, and T. C. Crawford, from a judgment of Mr. Justice Ridley, sitting without a jury at the Durham Summer Assizes.

In this case the appellants were sued as the trustees of the will of the late Mr. Thos. Crawford for damages for the subsidence caused through the alleged working of coal beneath the surface owned by the several plaintiffs. The colliery company, having submitted to judgment, had no concern in the present appeal.

It appeared that the surface upon and the minerals beneath the area in question originally belonged to the Dean and Chapter of Durham, and afterwards became vested in the Ecclesiastical Commissioners. A lease of the minerals was granted in 1887 by the Commissioners to Mr. Thos. Crawford, and he worked the coal down to the date of his death in September, 1887. By his will Mr. Crawford devised all his rights under the lease to his trustees in trust for his daughter, and the trustees worked the colliery down to 1896, when they sold the testator's interest under the lease to the defendant colliery company. In January, 1906, serious subsidences took place with the result that a great amount of damage was done to property on the surface, and it was stated by counsel that eighty other actions awaited the result of the present appeal. Mr. Justice Ridley held that, notwithstanding the trustees had assigned their testator's interest in the lease to the colliery company, they were liable for what had occurred under the covenant entered into by the testator contained in the lease. Hence the present appeal of the trustees.

In the result judgment was reserved.

CASE UNDER BUILDING BY-LAWS AT FELTHAM.

AT Feltham, on the 16th inst., the Rev. John Page Hopps was summoned by the Staines Rural District Council for contravening the by-laws of the Council by failing to give notice and to send in a plan of alterations at his residence, The Roserie, Broadlands-avenue, Shepperton. Mr. C. E. Goddard, who prosecuted, said that in 1902 Mr. Page Hopps submitted to the Council a plan for the building of his residence, which was approved. It was a one-story house, the thickness of the walls being 9 in. On November 19 last, when the Council's surveyor was passing Mr. Page Hopps's house, he noticed alterations being carried out, indicating that a room was being prepared under the roof, so he wrote to the defendant pointing out that such an addition to the house constituted a breach of the by-laws.

Mr. Page Hopps wrote in reply:—"The roof space was boarded, and I use it for storage. It was damp, dark, cold, and dirty. I am sorry if any by-laws have been forgotten, but I should have thought that the conversion of such a space into a properly-lighted one ought to be a subject for congratulation." Mr. Goddard added that if the house was going to be converted into a two-story house the lower walls should be 13½ in. thick, and plans should have been submitted.

Mr. George Manning, Surveyor to the Staines Rural District Council, said he noticed the alterations to the roof as he passed the house, and saw that three dormer windows were being made in it.

Mr. Page Hopps: That is not correct. There is only one dormer window.

Witness: I saw three.

Mr. Page Hopps: Then you guessed it, sir.

The Chairman: Is there any objection to a gentleman placing dormer windows in his roof simply to give more light?

Mr. Goddard: Certainly not, but plans should be deposited showing the alteration.

The Chairman (Mr. J. Ashby) said he thought the best plan would be to adjourn the summons to give the defendant an opportunity of sending in a plan.

Mr. Page Hopps: I daresay that can be done. But what is to happen after the adjournment? How far can you rely on this gentleman who has sworn that he has seen three dormer windows? It is a serious matter.

Eventually Mr. Page Hopps agreed to send in a plan, and the summons was adjourned.—*Tribune.*

Patents of the Week.

APPLICATIONS PUBLISHED.*

26,181A of 1906.—W. FAWCETT and J. FORSYTH: *Machines for Cutting, Turning, and Dressing Stone, particularly Grindstones and the like.*

THIS relates to a machine for cutting, turning, and dressing stone, particularly grindstones, comprising a horizontal rotating-table adapted to receive and hold the stone to be operated upon, a tool holder carrying one or a plurality of tools above and at an angle with the upper surfaces of the said stone, means for raising, lowering, and traversing said tool holder with respect to the table, and an adjustable tool holder carrying one or more tools and carried by a horizontal and adjustable swinging-arm so arranged that the tools may be caused to operate on the edges of said stone.

26,194 of 1906.—J. B. DAVIES: *Spouting Bracket.*

This relates to a spouting bracket, comprising wire bent to suit the sectional form of spouting, and having a screw at one end for supporting it and a flexible strip at the other end for gripping the edges of spouting.

976 of 1907.—F. W. TANNET-WALKER: *Hydraulic Cranes.*

This relates to a hydraulic crane, and consists in racking the monkey in and out by means of cylinders which are raised and lowered with the crane pillar.

1,729 of 1907.—R. MCALPINE: *Construction of Floors and Roofs of Buildings of Curved Concrete Segments.*

This invention relates to the construction of floors and roofs of buildings of curved concrete segments, consisting in moulding these curved concrete segments by any suitable means, partly or wholly drying them, and then placing them in position on the floor or roof.

5,361 of 1907.—J. NEEDS: *Construction of Railway Sleepers, Lintels, Posts, Floor Joists, and the like.*

This relates to reinforced concrete railway sleepers, posts, joists and the like, of the kind comprising a body of concrete having an insertion of wire netting in the form of transverse sheets and corrugated or arched sheets located between the transverse sheets.

10,634 of 1907.—A. G. BLOXAM: *Device for Securing Stays for Posts or the like.*

This relates to a device for securing stays for posts or the like, comprising a sleeve rectangular in cross section at the wider end and tapering to an elliptical cross section at the other end. For a distance of about two-thirds of the length of the sleeve from the narrower end the interior is divided into tapering channels by means of ribs. The end of the stay is threaded through one of these channels from the narrow end and then through the other channel from the wide end, thus forming a loop in which may be fitted a grooved guide to facilitate attachment to a hook, eye-bolt, or the like. The end of the stay is then preferably turned back over the sleeve, and may be bound thereto by a suitable ligature.

12,957 of 1907.—N. W. FROGLEY: *Window Sashes and Fastenings therefor.*

This relates to a double-hung window sash with connexions operating vertically in the ordinary manner, the lower sash being capable of being drawn inwards, moving pivotally on its base or lower rail of its frame out of its vertical position and secured to rest at an angle so as to provide an air-opening between the upper and lower sashes while otherwise encased or closed at the sides.

13,048 of 1907.—J. S. MCGIEHAN: *Floor Tiles.*

This relates to the combination with a floor tile composed of carborundum and a suitable binding agent of a mesh binder, such as wire-netting.

15,025 of 1907.—J. HARTNESS: *Turning Tools.*

This relates to a tool for turning metal characterised by a crank shaft socketed in the frame, and having on its crank arm a pin which constitutes a carrier and a rotatable work-rest journalled on the pin.

5,629 of 1907.—F. WILLIAMS: *Floor Cramp.*

This relates to a floor cramp made in two portions, one upper and one lower, and one sliding in and acting with the other, comprising a pair of toothed grips acting simultaneously directly under the cramp which are attached to levers working inside the cramps.

5,153 of 1907.—R. BROWN: *Device for Preventing or Counteracting Blow-downs in Chimney Flues.*

This relates to a device for preventing or counteracting blow-downs in chimney flues, consisting of a pipe, tube, or chamber provided with an enlargement at one side thereof, said enlargement being suitably curved and shaped so as to direct a descending current of air from the side of the flue at which it descends to the opposite side, or side of updraught. The device is or may be made of fire-clay, and may be built into any convenient and practical part of the flue between the fireplace and the chimney top, preferably at or about 4 ft. from the top of the fireplace-opening, the enlargement being at the lower side of the flue run.

7,668 of 1907.—S. H. EXCELL and S. EXCELL: *Rotary Chimney Cowls.*

This relates to a rotatable chimney cowl or hood, consisting of a horizontal tube with an opening at its base and a bar across the said opening united to a short, vertical tube which is adapted to be fitted on a vertical smoke-pipe. The said horizontal tube has a central spindle attached to said bar across the opening in its base, upon which it turns, and also has a wedge-shaped vein formed and fitted to the outside of the top for cutting the wind current, and baffle plates at each end for directing the smoke.

2,223 of 1907.—G. F. WARWICK and T. W. LEETE: *Machines for Making Screws.*

This relates to a screw-making machine for producing screw blanks from wire, the diameter of which is substantially equal to the desired screw head, and consists of means for rolling said wire to reduce its diameter at certain places corresponding to the required diameter of the screw shank, means for fitting the blank thus formed by a cutting-off device into a holder, dies for shaping and finishing the formation of the head of the blank in the holder, and means for feeding the blanks to threading rollers.

7,721 of 1907.—H. A. JOHNSTON: *Screw and Driver therefor.*

This relates to a screw provided in its head with a groove extending there-across, and with a central socket the walls of which are perpendicular to the bottom wall of the groove, said socket extending below the groove and of a diameter greater than that of the groove throughout the length of the latter, and a driver provided with a blade edge adapted to fit in such grooves, and with a nib projecting through such edge adapted to be inserted in said socket, said nib being cylindrical.

7,870 of 1907.—A. J. SKILLMAN: *Window Sashes.*

This invention relates to sliding and pivoted window sashes, and consists in operating the locking-bar by means of a lever pivoted at one end to the said bar and at the opposite end to a stud provided with a thumb-piece or catch working in a slotted plate fixed to the window sash.

8,760 of 1907.—T. M. MORGAN: *Rotary Cement Kilns.*

This invention relates to rotary kilns for burning cement, and consists in dividing a kiln of frusto-conical form considerably larger at the rear than at the mouth. The longitudinal axis of the kiln is inclined in the usual manner approximately ¾ in. to the foot, while the bottom of the kiln remains in a horizontal plane. Near the rear end of the kiln a wall is provided having a series of circumferential apertures which are obliquely disposed with reference to the axis of the kiln, which allows the cement fed in at the rear end of the kiln to flow through by gravity towards the front, and at the same time allow the burnt gases to escape into the stack. In order to prevent the cement at the rear end of the kiln from being fed forward too rapidly, owing to the increased circumferential velocity at the enlarged end of the kiln, one or more retarding rings are provided which regulate the feeding of the cement through the kiln. Owing to the increased diameter the velocity of the burning gases is retarded at the enlarged end of the kiln, and a large amount of heat, ordinarily given up in stack bosses, is deflected back towards the mouth of the kiln by the rotary rings and rear wall, and is absorbed by the cement.

PATENTS.—*Continued on page 688.*

* All these applications are in the stage in which opposition to the grant of patents upon them can be made.

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, iv.; Contracts, iv. vi. viii. x.; Public Appointments, xix.; Auction Sales, —.

Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

***** It must be understood that the following paragraphs are printed as news, and not as advertisements: and that while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur.**

Competitions.

JANUARY 6.—**Sunderland.**—TECHNICAL COLLEGE EXTENSION.—The B.C. of Sunderland invite designs from architects practising in Sunderland who have had a bona-fide office as such in the borough for the past twelve months, and from the firm who designed the existing college buildings, in competition for proposed extension of technical college for engineering laboratories and day training college adjoining the college in Green-terrace. Premiums of 100*l.* and 50*l.* are offered for first and second selected designs respectively. Instructions to competitors, etc., may be obtained from Mr. John W. Moncur, A.M.Inst.C.E., Borough Engineer.

* NO DATE.—**Ilford.**—HOSPITAL.—The Governors of the Ilford Emergency Hospital invite plans for hospital. For further particulars refer an an advertisement in this issue.

Contracts.

BUILDING.

DECEMBER 23.—**Bishop's Stortford.**—ENGINE-HOUSE EXTENSION.—Bishop's Stortford U.D.C. invite tenders for carrying out the work of extending the engine-house at their Waterworks. Plans, etc., can be seen, and form of tender obtained, from the Council's Engineer.

DECEMBER 23.—**Edinburgh.**—BATHROOM, ETC.—The Edinburgh P.C. invite tenders for the forming of new bathroom and linen presses in main house building, Craiglockhart Poorhouse. Plans, etc., may be seen and inspected at the office of the architect, Mr. R. M. Cameron, 53, Great King-street, Edinburgh.

DECEMBER 23.—**Sandsend, Whitby.**—ADDITIONS TO VILLA RESIDENCE.—Additions to villa residence at Sandsend for Dr. Tinley. Plans may be seen, and quantities obtained, at the office of Mr. Edward H. Smales, A.R.I.B.A., architect, 5, Flowergate, Whitby.

DECEMBER 24.—**St. Leonards-on-Sea.**—FIRE-STATION.—Hastings Corporation invite tenders for building a fire-station in Shepherd-street, St. Leonards-on-Sea. Drawings, etc., may be seen, and form of tender, etc., obtained, at the office of Mr. P. H. Palmer, M.Inst.C.E., Borough Engineer, Town Hall, Hastings, on deposit of a cheque for 1*l.* 1s.

DECEMBER 24.—**Thorn, near Johnstone.**—CEMETERY WORKS.—Paisley P.C. invite tenders for (1) building enclosure walls; (2) draining and laying out addition to cemetery, extending to about 5 acres. Schedules, etc., for each contract may be had from Mr. Peter Kerr, C.E., Johnstone, on payment of 10s.

DECEMBER 25.—**Fraserburgh.**—SCHOOL ADDITIONS.—The mason, carpenter, slater, plasterer, plumber, glazier and painter, ironfounder, and blacksmith works at New Central School for Cookery, Laundry, and Manual Instruction, to be erected at Fraserburgh for the Fraserburgh School Board. Plans, etc., may be seen with Mr. Alex. Henderson, Clerk to the Board at Fraserburgh, and with Messrs. D. & J. R. M'Millan, architects, 105, Crown-street, Aberdeen.

DECEMBER 27.—**Bristol.**—LODGE.—Bristol Guardians invite tenders for the erection of a porter's lodge at the Eastville Workhouse, in accordance with plans, etc., which will be deposited for inspection at office of Mr. J. J. Simpson, Clerk to the Guardians, St. Peter's Hospital.

DECEMBER 27.—**Sheepridge.**—ALTERATIONS TO STORES.—Sheepridge Equitable Industrial Society, Ltd., invite tenders for the erection of additions and alterations to the store at Sheepridge. Plans may be seen, and bills of quantities obtained, at office of Mr. J. Berry, architect, surveyor, and valuer, 3, Market-place, Huddersfield.

DECEMBER 28.—**Rishworth.**—RESIDENCE.—The masons' and bricklayers', carpenters' and joiners', plumbers' and glaziers', slaters', plasterers', and concretors' work required in the erection of a residence at Rishworth. Plans, etc., may be seen, and bills of quantities obtained, at offices of Messrs. Joseph F. Walsh & Graham Nicholas, F.R.I.B.A., architects, Museum-chambers, Halifax.

DECEMBER 30.—**Leicester.**—SHELTER.—Leicester Parks and Recreation Grounds Committee invite tenders for the erection of shelter, urinals, and water-closets. Plans, etc., may be seen, and copies of the specification obtained, at the Borough Surveyor's office, Town Hall, on payment to the Borough Treasurer of the sum of 10s. Cheques, etc., to be made payable to the Leicester Corporation.

DECEMBER 31.—**Burghead.**—ADDITIONS TO CHURCH.—The mason, carpenter, slater, plaster, plumber, and painter works of addition to United Free Church, Burghead. Plans may be seen with Mr. Hugh Fraser, Stationmaster, Burghead, or with Messrs. Wilson & Walker, architects, Aberdeen.

DECEMBER 31.—**Llanfairfechan.**—SCHOOL.—The erection and construction of a new Council school at Llanfairfechan. Plans, etc., to be seen with Miss Widiams, Head Teacher, Caersalem School, Llanfairfechan.

* DECEMBER 31.—**Staffs.**—NEW SCHOOLS.—The Staffordshire Education Committee invite tenders for proposed Council Schools at Talke and Butt-lane, in the Parish of Audley, near Newcastle, Staffs. For further particulars refer to an advertisement in this issue.

JANUARY 1.—**Coventry.**—CORN EXCHANGE, ETC.—Coventry Market Hall Committee invite tenders for the work required to be executed and materials supplied in the erection of new Corn Exchange and shops, Smithford-street. Drawings, etc., may be inspected, and bills of quantities obtained, after payment of 1*l.* 1s. to the City Treasurer on application to the office of Mr. J. E. Swindlehurst, City Engineer and Surveyor, St. Mary's Hall, Coventry.

JANUARY 1.—**Dublin.**—HOUSE.—The Dean's Grange Joint Burial Board invite tenders for erecting, in Dean's Grange Cemetery, a house of concrete, wood, and iron, to be used as a shelter and waiting-room. Plans, etc., to be seen at the Registrar's Office, Dean's Grange Cemetery.

* JANUARY 1.—**Portsmouth.**—RECEPTION STATION.—Tenders are invited for the erection of reception station and recruiting office at Portsmouth. For further particulars see advertisement in this issue.

JANUARY 2.—**Derby.**—WALLS, ETC.—Derby Corporation invite tenders for the pulling down of property, Cheapside, and for the erection of boundary walls and construction of right-of-way, etc. Plans, etc., may be seen, and form of tender, etc., obtained, on application at the office of Mr. John Ward, M.Inst.C.E., Borough Surveyor, Babington-lane, Derby.

JANUARY 2.—**Hastings.**—COVERED WAY.—Hastings Guardians invite tenders for the erection of a covered way at their Workhouse, Frederick-road, Hastings. A plan, etc., may be seen at the office of the architects, Messrs. A. W. Jeffery & Son, 5, Havelock-road, Hastings.

* JANUARY 3.—**Sandhurst.**—ADDITIONS TO MILITARY COLLEGE.—Tenders are invited for the work in foundations, etc., in connexion with the proposed new cadet blocks, etc., at the Royal Military College, Sandhurst. For further particulars see advertisement in this isue.

JANUARY 4-21.—**Birmingham.**—SCHOOL.—Birmingham Education Committee invite tenders for the erection of a Council school in Leigh-road, Washwood Heath, Birmingham. Applications for forms, etc., may be made in the Finance Office of the Education Department, Edmund-street, Birmingham, accompanied by a deposit of 2*l.* The drawings may be seen on and after the same date in the Architect's Office at the Education Department.

JANUARY 7.—**Blaydon and Chester-le-Street.**—SCHOOLS.—The C.C. of Durham invite tenders for new Council schools at Blaydon and Chester-le-Street. Plans, etc., can be seen, and bills of quantities obtained, as follows:—(1) For Blaydon School—At the office of Mr. J. Morson, 77, Westgate-road, Newcastle-on-Tyne. (2) For Chester-le-Street Schools—At the office of Mr. W. H. Knowles, 25, Collingwood-street, Newcastle-on-Tyne.

JANUARY 7.—**South Bank.**—CLUB PREMISES.—Separate tenders for the erection of proposed new Unionist Club premises at South Bank. Plans, etc., may be seen at the offices of Mr. Fred Walshaw, architect, 59, Lorne-terrace, South Bank, S.O., Yorks.

JANUARY 8.—**Hull.**—SHOPS AND OFFICES.—North-Eastern Railway Directors invite tenders for erecting shops and offices in Victoria-square, Hull. Plans, etc., may be seen, and quantities and further information obtained, on application to Mr. William Bell, the Company's Architect, at York.

* JANUARY 8.—**Wakefield.**—POST-OFFICE.—The Commissioners of H.M. Works, etc., invite tenders for the enlargement of the Wakefield Post-office. For further particulars see advertisement in this issue

* JANUARY 8.—**Woolwich.**—COAL STORE.—The Metropolitan Asylums Board invite tenders for the erection of new coal store at Brook Fever Hospital, Shooters Hill, Woolwich. For further particulars see advertisement in this issue.

JANUARY 10.—**Northallerton.**—SCHOOL.—North Riding of Yorkshire C.C. Education Committee invite tenders for proposed new secondary school at Northallerton. Apply to the architect, Mr. Walter H. Brierley, F.S.A., of 13, Lendal, York, where the drawings, etc., may be seen, and bills of quantities obtained.

JANUARY 11.—**Barrow-in-Furness.**—CATTLE MARKET.—The Corporation invite tenders for the construction of a cattle market, in connexion with the Public Abattoirs. Plans may be seen, and bill of quantities, etc., obtained, upon application at the Borough Engineer's Office, Town Hall.

JANUARY 11.—**Macclesfield.**—TIMBER SHED.—Macclesfield Markets Committee invite tenders for providing and erecting a timber-constructed shed in the Shambles. The plan, etc., can be seen at the office of Messrs. Whittaker & Bradburn, architects, 10, King Edward-street.

* JANUARY 18.—**Bilston.**—NEW SCHOOLS.—The Bilston Education Committee invite tenders for new schools at Bull-holes, Bilston. For further particulars refer to an advertisement in this issue.

* JANUARY 25.—**St. Helens.**—NEW SCHOOLS.—The St. Helens County B.C. invite tenders for new schools. For further particulars refer to an advertisement in this issue.

NO DATE.—**Usworth.**—HOUSES.—Erection of forty-one four-roomed houses at Usworth Colliery. Plans and specifications may be seen by appointment. Apply Mr. Douglas, Usworth Colliery Office.

ENGINEERING, IRON, AND STEEL.

DECEMBER 23.—**Birmingham.**—IRON STAIRCASES.—Birmingham Guardians invite tenders for iron escape staircases at the new able-bodied block in course of erection at the Birmingham Workhouse. Plans, etc., may be inspected at the offices of Mr. W. H. Ward, architects, Paradise-street, Birmingham.

DECEMBER 30.—**Bury.**—IRON CASTINGS.—The Bury and District Joint Water Board invite tenders for iron castings required during the year ending December 31, 1908. Particulars and form of tender may be obtained on application to Mr. R. B. Rigby, Waterworks Manager, Parson's-lane, Bury.

JANUARY 7.—**Sheffield.**—STEEL AND IRONWORK.—The Directors of the Sheffield United Gas Light Company invite tenders for the supply of steel and ironwork for twelve settings of retorts at their Neepsend Works. Drawings may be seen, and specification, etc., obtained, upon application to the Engineer, Mr. J. W. Morrison, at the Company's Offices, Commercial-street, Sheffield.

* JANUARY 14.—**Walthamstow.**—HYDRAULIC LIFT.—The Walthamstow U.D.C. invite tenders for the supply of a hydraulic lift. For further particulars see advertisement in this issue.

FEBRUARY 11.—**Adelaide.**—TRAMWAY WORKS.—The Municipal Tramways Trust, Adelaide, S.A., invite tenders for the supply and delivery c.i.f. Port Adelaide, of special work, points, and crossings for tramways. Specification, etc., can be obtained on application to the Agent-General for South Australia, Threadneedle House, 28, Bishopsgate-street Within, London, E.C. The sum of 3*l.* 3s. will be charged per copy of specification.

MISCELLANEOUS.

* JANUARY 13.—**Bromley.**—REFUSE-DESTROYING PLANT.—The Metropolitan Borough of Poplar invite tenders for installing a modern refuse-destroying plant at the Yeo-street Depôt, Bromley. For further particulars see advertisement in this issue.

NO DATE.—**Camborne.**—BRICKING SHAFT.—For bricking sinking shaft. For particulars apply Manager, Williams' Shaft, Camborne.

PAINTING, etc.

DECEMBER 23.—**Leeds.**—CLEANING, ETC.—Leeds Corporation invite tenders for cleaning down, painting, etc., at the York-road, Hunslet, and Bramley Baths. Forms of tender, etc., may be obtained, and copies of the documents forming the contracts may be inspected, at the City Engineer's Office, on payment of a deposit of 1*l.* 1s.

DECEMBER 23.—**Leeds.**—GLAZING.—Leeds Corporation invite tenders for the reglazing of the roofs at the Hunslet, Holbeck, and Kirkstall-road Baths. Forms of tender, etc., may be obtained, and copies of the documents forming the contract may be inspected, at the City Engineer's office on payment of a deposit of 1*l.* 1s.

JANUARY 6.—**Denholme.**—PAINTING.—For painting and decorating Mechanics' Hall and staircases at Denholme. Mr. Peter Wright, Secretary.

ROADS, SANITARY, AND WATER WORKS.

DECEMBER 23.—**Finchley.**—SEWER.—The U.D.C. of Finchley invite tenders for surface-water sewer, Friern Park and Grove-road. Drawings may be inspected, and specification, etc., obtained, on application to the Council's Surveyor, Mr. C. J. Jenkin, A.M.Inst.C.E., Council Offices, Church End, Finchley, N., on deposit of the sum of 2*l.*

DECEMBER 23.—**Manchester.**—WATER-PIPES.—The Manchester Corporation Electricity Committee invite tenders for the supply and erection of low-pressure circulating water-pipes to canal and footbridge over canal arm at their Bloom-street generating-station. Specifications, etc., may be obtained from Mr. F. E. Hughes, Secretary, Electricity Department, Town Hall, Manchester, on payment of 1*l.* 1s.

DECEMBER 24.—**Surbiton.**—STREET WORKS.—The U.D.C. of Surbiton invite tenders for private street works at Beaconsfield-road, in the Urban District of Surbiton. Plans, etc., can be inspected at the offices of the Council during office hours, and a copy of the estimated quantities will be supplied at the request of those who have examined the plans.

DECEMBER 28.—**Liversedge.**—SEWAGE DISPOSAL.—Liversedge U.D.C. invite tenders for the excavation, brickwork, concrete, ironwork, pipe laying, and other work necessary for the reconstruction of their upper sewage disposal works at Liversedge. Drawings, etc., may be seen, and bills of quantities, etc., obtained, at offices of Messrs. Chas. Gott & Sons, MM.Inst.C.E., Engineers to the Council, 8, Charles-street, Bradford, on deposit of the sum of 1*l.* 1s.

DECEMBER 30.—**Sculcoates.**—SEWER.—Sculcoates R.D.C. invite tenders for the construction of 1,530 lin. yds. of brick sewer, 3 ft. 3 in. by 2 ft. 2 in., on the Holderness-road, and 333 lin. yds. of 12-in. pipe sewer on Marfleet-lane. Plans, etc., may be seen, and bill of quantities obtained, at office of Mr. William H. Wellsted, Engineer to the Council, Waterloo-chambers, on payment of a deposit of 2*l.* 2s.

* JANUARY 2.—**Chiswick.**—ROAD-MAKING.—The Chiswick U.D.C. invite tenders for making-up of Bolton-road, Devonshire-gardens, Spencer-road, and parts of other roads. For further particulars refer to an advertisement in this issue.

JANUARY 2.—**Plumstead.**—ROAD WORKS.—For ground work in excavating and forming a proposed road about 650 yds. long at Plumstead, in accordance with drawings and specification prepared by Messrs. Thomas Dinwiddy & Sons, architects and surveyors, of 54, Parliament-street, S.W., and Greenwich, from whom copies, etc., may be obtained upon deposit of 2*l.* 2s.

JANUARY 3.—**Bexhill.**—ROAD WORKS.—Bexhill Corporation invite tenders for making-up the following roads:—No. 1.—Dorset-road (part). No. 2.—Dorset-road (part). No. 3.—De La Warr-road (part). Plans may be seen, and specification, etc., obtained, upon application to the Borough Surveyor, Mr. George Ball, A.M.Inst.C.E., Town Hall, upon payment of 1*l.* 1s.

JANUARY 3.—**Ulverston.**—MAKING-UP.—The U.D.C. of Ulverston invite tenders for the making and forming of Summerville-road, Kilners Park, Ulverston. Plans, etc., can be seen at the offices of the Surveyor of the Council.

JANUARY 4.—**Middlewich.**—SEWAGE WORKS.—Middlewich U.D.C. invite tenders for the construction of septic tanks, filter beds, and other sewage-disposal works at their Sewage-disposal ground, Middlewich. Drawings, etc., can be inspected at the office of Mr. Frederick W. Stocks, F.S.I., the Council's Engineer, Town Hall, Middlewich.

JANUARY 4.—**Newburn.**—FLAGS.—Newburn U.D.C. require tenders for about 500 sq. yds. of concrete flags delivered at Newburn Station. Particulars may be obtained from Mr. Thomas Gregory, Surveyor, Council Offices, Newburn.

JANUARY 4.—**Perth.**—CAUSEWAYING.—Perth T.C. invite tenders for the causewaying of the Shore-road, from the Water House to south side of M'Quiban's-buildings. Plans can be seen, and specifications, etc., obtained, at the office of Mr. Robert M'Killop, Burgh Surveyor, 16 Tay-street, Perth.

JANUARY 5.—**Prescot.**—SEWAGE DISPOSAL.—Prescot U.D.C. invite tenders for the construction of sewage disposal works at Prescot, Lancashire. Plans, etc., may be seen, and specification obtained, on application to the Engineer, Mr. Harry W. Taylor, A.M.Inst.C.E., St. Nicholas-chambers, Newcastle-on-Tyne, or Mr. Henry Cross, Clerk to the District Council, Prescot, Lancashire, on payment of 3*l.* 3s. deposit.

* JANUARY 6.—**Streatham.**—PAVING, ETC.—The Metropolitan Borough of Wandsworth invite tenders for making-up and paving of Harborough-road, Streatham. For further particulars see advertisement in this issue.

JANUARY 6.—**Warrington.**—STREET WORKS.—Warrington Paving and Sewerage Committee invite tenders for the forming and paving of nine streets and fourteen passages. Drawings, etc., may be seen, and forms of tender, etc., obtained, at the office of the Borough Surveyor, Town Hall.

JANUARY 7.—**Brynmawr.**—DRAINAGE.—Brynmawr U.D.C. invite tenders for the work of altering the course of the sewage conduit leading to the Sewage Farm. Specifications, etc., may be seen at the surveyor's office, Market-chambers, Brynmawr.

JANUARY 8.—**Carshalton.**—ROAD WORKS.—Carshalton U.D.C. invite tenders for the making-up of Hill-road, in accordance with the plans, etc., which have been prepared by the Council's Surveyor, Mr. William Willis Gale, A.M.Inst.C.E. Bills of quantities, etc., can be obtained on application at office of Mr. C. P. Lovelock, Clerk, D.C. Offices, High-street, Carshalton, and on deposit of 1*l.*

JANUARY 10.—**Wimbledon.**—MAKING-UP.—Wimbledon Corporation invite tenders for the making-up of Revelstoke-road, plans for which may be inspected, and form of tender obtained, on application at the Borough Surveyor's Office, Town Hall, Wimbledon.

* JANUARY 28.—**London.**—SEWERS.—The London C.C. invite tenders for the construction of about 29,609 ft. of brick sewer, 7 ft. internal diameter, etc. The works will be executed in the Metropolitan Boroughs of Paddington, St. Marylebone, St. Pancras, Islington, Hackney, and Shoreditch. For further particulars refer to an advertisement in this issue.

NO DATE.—**Embo, Sutherland.**—LAYING PIPES.—The C.C. of Sutherland invite tenders for laying 2,000 lin. yds. of a 3-in. cast-iron water main, 4,000 lin. yds. of 4-in. fireclay pipes, and 1,000 yds. of open water course in connexion with Embo water supply. Plans, etc., may be seen at the office of Mr. J. M. Macgregor, County Surveyor, Dornoch, on giving two days' notice, and bills of quantities may be had on payment of 1*l.* 1s.

STONE, MATERIALS, AND STORES.

DECEMBER 24.—**Alnwickhill, Edinburgh.**—SAND FOR FILTERS.—Edinburgh and District Water Trustees invite tenders for providing and delivering about 1,500 tons of clean sharp filtering sand for the filters at Alnwickhill, about one and a half miles from Newington Station. Copies of the specification, etc., may be obtained at the office of the engineer, Mr. W. A. Tait, C.E., 72A, George-street, Edinburgh.

DECEMBER 24.—**Edinburgh.**—STORES.—The Commissioners of Northern Lighthouses invite tenders for the supply of stores. Tenders must be made on printed forms, which may be obtained from the Superintendent, 84, George-street, Edinburgh.

DECEMBER 24.—**Garforth.**—STORES.—The owners of Garforth Colliery invite tenders for colliery stores for the year 1908. Forms of tender may be obtained on application to the owners of Garforth Colliery, near Leeds.

DECEMBER 27.—**Banbury.**—PIPES, LIME, ETC.—The T.C. invite tenders for one year's supply of stone-ware pipes, lime, and cement. Specification, etc., can be obtained on application at office of Mr. N. H. Dawson, C.E., Borough Surveyor, Town Hall, Banbury.

DECEMBER 30.—**Ashford.**—ROAD METAL.—Ashford Cattle Market Company, Ltd., invite tenders for the supply and delivery of 130 yds. of unbroken rock and 10 yds. of fine gravel. Mr. F. Hughes-Hallett, Secretary, 11, Bank-street, Ashford.

DECEMBER 30.—**Saddleworth.**—ROAD MATERIALS.—Saddleworth U.D.C. invite tenders for supply of material for road repairs. Tender forms may be obtained on application to the Surveyor, Council Offices, Uppermill, near Oldham.

DECEMBER 31.—**Hove.**—FLINTS.—For supplying about 1,680 cubic yds. of broken Coombe rock flints, delivered at Hove Park. Further particulars may be obtained at the office of the Borough Surveyor, Mr. H. H. Scott.

JANUARY 1.—**Forden.**—STONE.—Forden R.D.C. invite tenders for the supply of stone. Mr. Charles S. Pryce, Clerk to the Council, Montgomery.

JANUARY 4.—**Rotherham.**—GRANITE SETTS, ETC.—Rotherham Highways Committee invite tenders for the supply of about 2,500 tons of granite setts, and about 275 tons of Portland cement. Further particulars and forms of tender can be obtained at the office of Mr. Ernest B. Martin, A.M.Inst.C.E., Borough Engineer, Town Hall, Rotherham.

Public Appointments.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*CARPENTER	Bermondsey Guardians	2*l.* per week	Jan. 18
*EVENING LECTURERS	Northern Polytechnic Inst.	See advertisement in this issue	No date
*INSTRUCTOR IN WOODWORK	Northern Polytechnic Inst.	See advertisement in this issue	do.
*CLERK OF WORKS	Salford Royal Hospital	Not stated	do.

PATENTS.—*Continued from page 686.*

18,497 of 1907.—T. SULLIVAN, W. JORGENSEN, and J. BUSBY: *Device for Holding Doors, Windows, Hoods, or the like in their Open or Partly-open Position.*

This relates to a device for securing a door or the like in its open or partly-open position, characterised by a slotted slide, an arm connected at one end to the door frame and working at its other end in said slotted slide in a horizontal plane, a knuckle-joint pivotally connected to a bracket or base plate on the frame so that the arm may have rotary movement in a vertical and horizontal plane, a wing-nut or equivalent device for locking the parts in their open or partly-open position, and an enlargement in the slot to permit of the separation of the parts.

18,558 of 1907.—K. K. SCHMIDT: *A Method for Preparing or Treating Timber for Joinery and Kindred Trades.*

This relates to a method of treating timber for joinery and kindred trades, characterised by the raw timber being buried in the ground in earth to which an alkaline lye with or without metallic salts has been added, and exposed to the action of ground gases until the desired complete or partial impregnation has taken place.

18,630 of 1907.—J. BERTRAM and F. OAKES: *Roofing of Dutch Barns, Stables, Sheds, and the like.*

This relates to roof-boards for Dutch barns, stables, sheds, and the like, comprising the combination of longitudinal grooves near the edges of said board parts inclined through the edges towards the grooves, bevelled tapered edges or rebates on the sides adjoining the edges or recesses in the edges, and a method of fixing the roof-boards which consists in the employment of pairs of studs, pins, or legs, the roof-boards being nailed, or pinned centrally between the said studs, pins, or pegs.

2,070 of 1907.—E. H. PARKINSON: *Domestic Sinks and the like.*

This relates to a sink provided with corbels formed by extending ends or sides or integral parts thereof, a beading or its equivalent, ledges or projections to support a refuse basket, and shelf portions at each end which are set apart for a soap dish, and ledges or projections to support a refuse basket.

13,819 of 1907.—F. J. M. M. DUCASTE: *Systems of Foundations for Compressible Submerged or Moist Ground.*

This relates to systems for foundations such as described in patent No.9,945-04, in which strata of both stable and unstable material occur, and consists in forming sheaths of impermeable material at those points in the hole formed by the pile driver where strata of unstable material occur, and a modification of the process described which consists when strata of unstable material are encountered in throwing into the hole which has been bored coarse material such as rubble or ashlar, then energetically ramming these materials so as to force them out laterally and then forming the impermeable sheath.

15,391 of 1907.—R. EWING: *Stoneware Drainage Tiles for Bacteria Beds.*

This relates to a drainage tile made of a horse-shoe formation with inwardly inclined feet or supports to form an opening or space between the feet of similarly shaped tiles placed side by side.

19,687 of 1907.—W. G. WIESENER: *Adjustable Plumb Bob.*

This relates to an adjustable plumb bob characterised by a slot formed through the body thereof, a hollow frame containing a winding drum actuated by a coil spring and controlled by a pawl adapted to fit within the said slot a removable cap adapted to lock the said frame within the slot, and a plumb line, one end of which is attached to the winding drum and the other threaded through a central hole in the said removable cap.

26,150 of 1906.—C. VON RADLOWSKI: *Rotary Kilns for Burning and Calcining Lime Cement, Chemicals, and the like.*

This relates to a rotary kiln for burning and calcining lime, cement, and other chemicals in which the material to be calcined is inserted into the kiln in a preliminary heater and removed from a cooling cylinder, the said material being continuously rotated, shaken, and thrown about so that it comes into complete contact with the gases of combustion in the preliminary heater and kiln and with the cooling air in the cooling cylinder.

26,366 of 1906.—C. H. DARBISHIRE: *Apparatus for Riddling or Sorting Stones.*

This relates to an apparatus for riddling or sorting stones which consists of a series of pairs of rollers mounted in a frame adapted to be vibrated and a series of angle guides to guide the stones to the openings between the pairs of rollers the adjacent peripheries of which move upwards, and means for rotating the rollers and for vibrating the riddle.

26,388 of 1906.—G. H. RAYNER and C. WALTON: *Rock Drills and other Percussive Tools.*

This relates to that class of percussive rock drills and other tools which are worked by compressed air or steam and in which the valve is thrown over and held in position during the travel of the main piston by the difference in areas exposed to the motive fluid pressure of two connected parts of the valve, and comprises a valve formed with a middle piston as a single collar which has a larger area exposed to the motive fluid than the end piston, the motive fluid inlet being so arranged with respect to said middle piston that the difference in area of said pistons produces the locking of the valve, while the provision of auxiliary passages and shallow grooves or leak ports enables the motive fluid to overcome the lock and effect the movement of the valve.

1,715 of 1907.—J. H. SLATER : *Stopper for Intercepting Traps, Siphons, and the like.*

This relates to a stopper for intercepting traps, siphons, and the like carrying internal arms or the like adapted to engage and lock behind lugs having inclined inner faces in the socket of the inspection arm or the like of the trap, said stopper having a projecting external arm and means of operating the same.

2,243 of 1907.—W. HERBST : *Tension Members for Use in the Construction of Metal and Concrete Floors.*

This relates to rolled iron and steel tension members for use in the construction of metal and concrete floors and consists in corrugating said members longitudinally and ribbing or webbing them transverely on both sides, the ribs or webs on one side being preferably intermediate of those on the other side, and the said members also have slight projections on both faces to provide a good hold for concrete and are preferably of greater thickness on one side of the middle line than on the other, the thickness increasing gradually from one edge to the other. When using these tension members in the construction of a floor they are placed on edge with the thicker side downwards. The transverse ribs resist lateral bending of the tension members when placed on edge.

2,625 of 1907.—E. H. PARKINSON : *Water-Closets.*

This relates to a wash-out waste water-closet provided with an automatic tipper, a partition in conjunction with the shallow trap for dividing the chamber into two separate compartments, viz.:—the tipper box or container and the basin.

2,628 of 1907.—J. L. GARSED : *Ventilators.*

This relates to a ventilator comprising an opening or passage way, a fixed deflector or shield hinged adjacent to the opening, and provided with flexible end pieces and cords or chains for manipulating the shield or deflector.

5,054 of 1907.—W. T. ROBERTSON : *Outside Window or Sunblinds.*

This relates to an outside window or sunblind, the combination, with a spring-roller blind supported in brackets and drawn down by cords attached to the projecting ends of a metal or other rod secured to the bottom of the blind, of pivoted arms having longitudinal slots for the draw cords to pass through, and at their free extremities upon side hook-shaped slots to receive the blind rod.

5,148 of 1907.—S. P. HAYWARD and T. H. HAYNES : *Cement or the like Brick or Block Making Machine.*

This relates to a new or improved means for the manufacture of solid or hollow or tubular cement or the like blocks or bricks, the body or mould of the machine consists essentially of a rectangular frame-like base supported on ends standards, to which base rectangular flaps constituting the vertical sides and ends respectively of the top or mould of the machine are hinged, the front side of flap being capable of turning from its normal or closed position downwards through a complete or nearly complete semicircle, and the rear side of the flap end sides or flaps being so geared together as to be capable of being simultaneously turned in either direction for the opening or closing of the body.

18,683 of 1907.—H. ZIMMERMAN : *Hinges.*

This relates to a hinge member, consisting of a bracket with plates at right angles to each other, one plate constituting or supporting one of the engaging members of the hinge, and a tubular boss extending from the other plate at right angles thereto, and a wing connecting the boss and its plate, all the parts being equally disposed on opposite sides of the same vertical plane.

19,438 of 1907.—G. C. C. HENDERSON : *Machines for the Moulding of Bricks, Tiles, Pipes, and other Plastic Substances.*

This invention relates to the valves and valve gear of direct steam pressing machines for moulding plastic substances, by which the steam used in the cylinder of the press to obtain the necessary force for the pressing stroke is used for the return or non-pressing stroke, and also to means by which the steam can be cut off during a considerable range of the stroke, or controlled by hand or automatically at will.

4,290 of 1907.—H. DUNFORD, H. BARTLETT, F. MILBURN, and R. N. TAYLOR : *Cowls or Guards for the Tops of Chimneys or Ventilating Shafts to prevent down draught in the same.*

This relates to cowls or guards for chimneys or ventilating shafts and consists in providing the chimney or shaft with brackets and the cowl or guard with legs or the like adapted to freely embrace and bear on said brackets so that the cowl or guard is normally supported vertically or concentrically with the chimney or shaft, but is free to be tilted or displaced by excessive wind pressure.

SOME RECENT SALES OF PROPERTY :

ESTATE EXCHANGE REPORT.

December 4.—By JOHN MARGETTS & SONS (at Leamington).

Gaydon, Warwick.—Castle Farm, 283 acres, f. .	£3,724

December 5.—By DOUGLAS YOUNG & CO. (at Cardiff).

Cardiff, Glamorgan.—Cathedral-rd., freehold building site	1,860

December 6.—By PERKINS & SONS (at Southampton).

Dibden, Hants.—Pink's Farm, etc., 87¼ acres, f.	3,525

December 10.—By DEBENHAM, TEWSON, RICHARDSON, & CO.

Ashford, Middx.—1 to 11, Spelthorne-gr., f., e.r. 143*l.*	345

By HUNTER & HUNTER.

Bloomsbury.—7 and 8, Heathcote-st., u.t. 11 yrs., g.r. 15*l.*, y. and e.r. 110*l.*	420
Islington.—41, Arlington-sq., u.t. 20 yrs., g.r. 5*l.* 5s., w.r. 68*l.* 18s.	210
Shoreditch.—117 to 123 (odd), Weymouth-ter., u.t. 12 yrs., g.r. nil, w.r. 156*l.*	450
Hackney.—23, Myrtle-st., u.t. 13 yrs., g.r. 3*l.*; w.r. 40*l.* 10s.	95

By ROGERS, CHAPMAN, & THOMAS.

Pimlico.—87, St. George's-sq., [illegible] mews, u.t. 28½ yrs., g.r. 4*l.*, p.	165

By FREDERICK WARMAN.

Highbury.—10, Highbury New-pk., u.t. 42 yrs., g.r. 15*l.*, p.	550
Wood Green.—Lower Woodside-rd., f.g.r. 10*l.*, reversion in 88 yrs.	225
Holloway.—30, Hargrave-pk., u.t. 54 yrs., g.r. 7*l.* 7s., y.r. 40*l.*	270

By BENJAFIELD & WOOD (at Lincoln).

Middle Rasen, Lincs.—Two enclosures of grass land, 4¼ acres, f.	366

By T. B. WESTACOTT.

Camden-square.—No. 27, u.t. 36¼ yrs., g.r. 10*l.*, e.r. 60*l.*	370

By GILLATT & SONS (at Machynlleth).

Isygarreg and Machynlleth, Montgomery.—Freehold farms, 73 a. 2 r. 13 p.	3,200

By GEORGE LOVEITT & SONS (at Coventry).

Stoneleigh, Warwick.—Limbrick Farm, 48 a. 1 r. 15 p.	2,815
20, Earlsdon-la., f., p.	1,000
Coventry, Warwick.—67, 69, 70, 81, 83, and 85, Stanley-rd., f., w.r. 54*l.* 12s.	1,250

COBB (at Rochester).

Newington, Kent.—Main-st. (s.), f., y.r. 25*l.* 18s.	525
Chatham, Kent.—Cleremont-pl., f.g. rents 16*l.* 7s. 6d., reversion in 16 yrs.	3,160
Bryant-street, f.g. rents 33*l.* 19s. 6d., reversions in 16 to 43 yrs.	1 350

December 11.—By BOYTON, SONS, & TREVOR.

Putney.—58, Mexfield-rd., u.t. 85 yrs., g.r. 6*l.* 6s., y.r. 33*l.*	245
Greenhithe.—The Terrace, St. Hilda's, u.t. 67 yrs., g.r. 10*l.*, p.	225

December 12.—By H. J. BLISS & SONS.

Bromley-by-Bow.—14 to 20 (even), Reeves-rd., u.t. 54¼ yrs., g.r. 10*l.* 4s., w.r. 96*l.* 4s.	450

By JOHN G. DEAN & CO.

Wandsworth.—18, Morella-rd., u.t., 74 yrs., g.r. 8*l.* 15s., y.r. 50*l.*	400

By NEWBON, SHEPHARD, & EDWARDS.

Finsbury Park.—114, 118, 120, 122, and 124, Wilberforce-rd., u.t. 59 yrs., g.r. 40*l.*, y. and e.r. 229*l.*	2,060
Kilburn.—Maygrove-rd., f.g. rents 15*l.*, reversion in 78¼ yrs.	345
Wood Green.—179, High-rd. (s.), u.t. 71½ yrs., g.r. 10*l.* 10s., y.r. 55*l.*	715
Pentonville.—39, Baker-st., u.t. 14½ yrs., g.r. 8*l.*, y.r. 45*l.*	150
New Southgate.—Sydney-rd., Preston Cottage, f., w.r. 26*l.*	310
Paddington.—77, Portnall-rd., u.t. 71 yrs., g.r. 7*l.*, w.r. 58*l.* 10s.	350

By ROBERT H. RUDDOCK.

Liphook, Hants.—Bramshott Paper Mills, lease 26 yrs., plant, etc.	2,100

By THOMAS SHARP (at Stratford).

Canning Town.—31, Church-st., and 9, Edward-st., f., w.r. 41*l.* 12s.	395
Barking.—16 to 28, London-rd., f., w.r. 184*l.* 12s.	1,825
Manor Park.—510, High-st. North (s.), f., w.r. 31*l.* 4s.	255
East Ham.—24, Wakefield-st. (s.), f., y.r. 35*l.*	345
90 to 100 (even), Cleves-rd., f., w.r. 109*l.* 4s.	640
102, Cleves-rd., and plot of land, f.	290
Upton Park.—Shaftesbury-rd., freehold building land	655
Barking-road.—Abbott's Park Estate, freehold building land	490

December 13.—ROBT. W. FULLER, MOON, & FULLER.

Great Waldingfield, Suffolk.—Folly Farm, 18 a. 3 r. 9 p., f. and c.	600

By NIGHTINGALE, PHILLIPS, & PAGE.

Holloway.—Seven Sisters-rd., l.g.r. 42*l.*, u.t. 35 yrs., g.r. 28*l.* 10s.	405
113, Seven Sisters-rd., u.t. 35 yrs., g.r. 6*l.* 10s., e.r. 45*l.*	300

By RIDER & SONS.

Regent's Park.—Munster-sq., l.g.r. 32*l.* 11s., u.t. 15 yrs.; 3 and 5, Wybert-st. (s.), u.t. 15 yrs., g.r. 18*l.* 18s., w.r. 92*l.* 7s.	200

By SELFE & CO.

Hammersmith.—9 to 27 (odd), Bradmore Park-rd., u.t. 56 yrs., g.r. 40*l.*, w.r. 325*l.*	2,000

Contractions used in this list.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for office; s. for shops; ct. for court.

MEETINGS.

FRIDAY, DECEMBER 20.

Architectural Association.—Mr. Arthur Keen on "Wren's City Churches." 7.30 p.m.

Glasgow Architectural Craftsmen's Society.—Mr. J. G. Dunn on "The Brickwork Setting of a Lancashire and a Saddle Boiler." 8 p.m.

Institution of Mechanical Engineers.—8 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. L. G. E. Morse on "The Mechanical and Thermal Efficiency of a Petrol Engine." 8 p.m.

SATURDAY, DECEMBER 21.

Glasgow Architectural Craftsmen's Society.—Socia evening.

SATURDAY, DECEMBER 28.

Royal Institution (Christmas Lectures adapted to a Juvenile Auditory).—Sir David Gill, K.C.B., LL.D., on "Astronomy, Old and New."—I. 3 p.m.

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum, and Canada 2ls. 8d. (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, etc., 26s. per annum.

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PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.			
Hard Stocks	1	6	0	per 1000 alongside, in river		
Rough Stocks and Grizzles	1	5	0	,,	,,	,,
Picked Stocks for Facings	2	10	0	,,	delivered.	
Flettons	1	5	6	,,	at railway depot.	
Red Wire Cuts	1	14	0	,,	,,	,,
Best Fareham Red	3	12	0	,,	,,	,,
Best Red Pressed Ruabon Facing	5	0	0	,,	,,	,,
Best Blue Pressed Staffordshire	3	15	0	,,	,,	,,
Do. Bullnose	4	0	0	,,	,,	,,
Best Stourbridge Fire Bricks	3	14	0	,,	,,	,,
GLAZED BRICKS.						
Best White and Ivory Glazed Stretchers	12	0	0	,,	,,	,,
Headers	11	0	0	,,	,,	,,
Quoins, Bullnose, and Flats	16	0	0	,,	,,	,,
Double Stretchers	19	0	0	,,	,,	,,
Double Headers	16	0	0	,,	,,	,,
One Side and two Ends	19	0	0	,,	,,	,,
Two Sides and one End	20	0	0	,,	,,	,,
Splays, Chamferred, Squints	20	0	0	,,	,,	,,
Best Dipped Salt Glazed Stretchers, and Header	12	0	0	,,	,,	,,
Quoins, Bullnose, and Flats	14	0	0	,,	,,	,,
Double Stretchers	15	0	0	,,	,,	,,
Double Headers	14	0	0	,,	,,	,,
One Side and two Ends	15	0	0	,,	,,	,,
Two Sides and one End	15	0	0	,,	,,	,,
Splays, Chamferred, Squints	14	0	0	,,	,,	,,
Second Quality White and Dipped Salt Glazed	2	0	0	,,	less than best.	

	£	s.	d.	
Thames and Pit Sand			6	6 per yard, delivered.
Thames Ballast			5	0 ,, ,,
Best Portland Cement		30	0	per ton, ,,
Best Ground Blue Lias Lime		19	6	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. depôt.

STONE.

	£	s.	d.	
BATH STONE—delivered on road waggons, Paddington Depôt			1	6½ per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt			1	8½ ,, ,,
PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	1		,, ,,
White Basebed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	2½		,, ,,

	£	s.	d.	
Ancaster in blocks	1	10		per ft. cube, delvd. rly. depôt.
Beer ,,	1	6		,, ,,
Greenshill ,,	1	10		,, ,,
Darley Dale in blocks	2	4		,, ,,
Red Corsehill ,,	2	2		,, ,,
Closeburn Red Freestone	2	0		,, ,,
Red Mansfield ,,	2	4		,, ,,
YORK STONE—*Robin Hood Quality.*				
Scappled random blocks	2	10		,, ,,
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3		per ft. super., ,,
6 in. rubbed two sides ditto, ditto	2	6		,, ,,

STONE (*continued*).

YORK STONE—*Robin Hood Quality (continued)*—

	s.	d.	
3 in. sawn two sides slabs (random sizes)	0	11½	per ft.cube,deld.rly.dep
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7½	,, ,,
1½ in. to 2 in. ditto, ditto	0	6	,, ,,
HARD YORK—			
Scappled random blocks.	3	0	per ft.cube. ,,
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	8	per ft. super. ,,
6 in. rubbed two sides ditto	3	0	,, ,,
3 in. sawn two sides slabs (random sizes)	1	2	,, ,,
2 in. self-faced random flags	0	5	,, ,,

SLATES.

In. In.	£	s.	d.	
20×10 best blue Bangor	13	2	6	per 1000 of 1200 at r. d.
20×12 ,, ,,	13	17	6	,, ,,
20×10 first quality ,,	13	0	0	,, ,,
20×12 ,, ,,	13	15	0	,, ,,
16×8 ,, ,,	7	5	0	,, ,,
20×10 best blue Portmadoc	12	12	6	,, ,,
16×8 ,, ,,	6	12	6	,, ,,
20×10 best Eureka unfading green	15	17	6	,, ,,
20×1 ,, ,,	18	7	6	,, ,,
18×10 ,, ,,	13	5	0	,, ,,
16×8 ,, ,,	10	5	0	,, ,,
20×10 permanent green	11	12	6	,, ,,
18×10 ,, ,,	9	12	6	,, ,,
16×8 ,, ,,	6	12	6	,, ,,

TILES.

	s.	d.	
Best plain red roofing tiles	42	0	per 1000 at rly. depôt.
Hip and Valley tiles	3	7	per doz. ,,
Best Broseley tiles	50	0	per 1000 ,,
Do. Ornamental tiles	52	6	,, ,,
Hip and Valley tiles	4	0	per doz. ,,
Best Ruabon red, brown, or brindled do. (Edwards)	57	6	per 1000
Do. Ornamental do.	60	0	,, ,,
Hip tiles	4	0	per doz. ,,
Valley tiles	3	0	,, ,,
Best Red or Mottled Staffordshire do. (Peakes)	51	9	per 1000 ,,
Do. Ornamental do.	54	6	,, ,,
Hip tiles	4	1	per doz. ,,
Valley tiles	3	8	,, ,,
Best "Rosemary" brand plain tiles	48	0	per 1000 ,,
Best Ornamental tiles	50	0	,, ,,
Hip tiles	4	0	per doz. ,,
Valley tiles	3	8	,, ,,
Best "Hartshill" brand plain tiles, sand-faced	50	0	per 1000
Do. pressed	47	6	,, ,,
Do. Ornamental do.	50	0	,, ,,
Hip tiles	4	0	per doz. ,,
Valley tiles	3	6	,, ,,

WOOD.

BUILDING WOOD.	At per standard. £	s.	d.		£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13	10	0	...	15	0	0
Deals: best 3 by 9	13	0	0	...	14	0	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11	0	0	...	12	0	0
Battens: best 2½ by 6 and 3 by 6	0	10	0		less than 7 in. and 8 in.		
Deals: seconds	1	0	0		less thn best.		
Battens: seconds	0	10	0	,,	,,		
2 in. by 4 in. and 2 in. by 6 in.	9	0	0	...	10	0	0
2 in. by 4½ in. and 2 in. by 5 in.	8	10	0	...	9	10	0
Foreign Sawn Boards— 1 in. and 1¼ in. by 7 in.	0	10	0		more than battens.		
¾ in.	1	0	0		,,		
Fir timber: best middling Danzig or Memel (average specification)	At per load of 50 ft. 4	10	0	...	5	0	0
Seconds	4	0	0	...	4	10	0
Small timber (8 in. to 10 in.)	3	12	6	...	3	15	0
Small timber (6 in. to 8 in.)	3	0	0	...	3	10	0
Swedish balks	2	10	0	...	3	0	0
Pitch-pine timber (30 ft. average)	4	0	0	...	4	15	0

JOINERS' WOOD.	At per standard. £	s.	d.		£	s.	d.
White Sea: first yellow deals, 3 in. by 11 in.	24	0	0	...	25	0	0
3 in. by 9 in.	22	0	0	,,	23	0	0
Battens, 2½ in. and 3 in. by 7 in.	16	10	0	,,	18	0	0
Second yellow deals, 3 in. by 1 in.	18	10	0	...	20	0	0
,, ,, 3 in. by 9 in.	17	10	0	...	19	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	...	14	10	0
Third yellow deals, 3 in. by 11 in. and 9 in.	13	10	0	...	15	0	0
Battens, 2½ in. and 3 in. by 7 in.	11	0	0	...	12	0	0
Petersburg first yellow deals, 3 in. by 11 in.	21	0	0	...	22	10	0
Do. 3 in. by 9 in.	18	0	0	...	19	10	0
Battens	13	10	0	...	15	0	0
Second yellow deals, 3 in. by 11 in.	16	0	0	...	17	0	0
Do. 3 in. by 9 in.	14	10	0	...	16	0	0
Battens	11	0	0	...	12	10	0
Third yellow deals, 3 in. by 11 in.	13	0	0	...	14	0	
Do. 3 in. by 9 in.	12	10	0	...	14	0	0
Battens	10	0	0	...	11	0	
White Sea and Petersburg— First white deals, 3 in. by 11 in.	14	10	0	...	15	10	
,, ,, 3 in. by 9 in.	13	10	0	...	14	10	
Battens	11	0	0	...	12	0	0
Second white deals, 3 in. by 11 in.	13	10	0	...	14	10	
,, ,, 3 in. by 9 in.	12	10	0	...	13	10	0
,, ,, battens	10	0	0	...	11	0	0
Pitch pine: deals	18		0	...	21	0	0
Under 2 in. thick extra	0	10	0	...	1	0	0
Yellow Pine—First, regular sizes	44	0	0		upwards		
Oddments	32	0	0		,,		
Seconds, regular sizes	33	0	0		,,		
Yellow Pine oddments	28	0	0		,,		

WOOD (*continued*).

JOINERS' WOOD (*continued*)—	At per standard. £	s.	d.		£	s.	d.
Kauri Pine—Planks, per ft. cube	0	3	6	...	0	5	0
Danzig and Stettin Oak Logs— Large, per ft. cube	0	3	0	...	0	3	6
Small ,, ,,	0	2	6	...	0	2	9
Wainscot Oak Logs, per ft. cube	0	5	6	...	0	6	0
Dry Wainscot Oak, per ft. sup. as inch	0	0	8½	...	0	0	9½
¾ in. do. do	0	0	7	...		—	
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0	0	9	...	0	1	0
Selected, Figury, per ft. super. as inch	0	1	6	...	0	2	6
Dry Walnut, American, per ft. super. as inch	0	0	10	...	0	1	0
Teak, per load	17	0	0	...	22	0	0
American Whitewood Planks, per ft. cube	0	4	0	...	0	5	0
Prepared Flooring, etc.—	Per square.						
1 in. by 7 in. yellow, planed and shot	0	13	6	...	0	17	6
1 in. by 7 in. yellow, planed and matched	0	14	0	...	0	18	0
1¼ in. by 7 in. yellow, planed and matched	0	16	0	...	1	0	0
1 in. by 7 in. white, planed and shot	0	12	0	...	0	14	6
1 in. by 7 in. white, planed and matched	0	12	6	...	0	15	0
1¼ in. by 7 in. white, planed and matched	0	15	0	...	0	16	6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0	11	0	...	0	13	6
1 in. by 7 in. ,, ,,	0	14	0	...	0	18	0
¾ in. by 7 in. white ,, ,,	0	10	0	...	0	11	6
1 in. by 7 in. ,, ,,	0	12	9	...	0	15	0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £	s.	d.		£	s.	d.
Rolled Steel Joists, ordinary sections	7	15	0	...	8	5	0
Compound Girders, ordinary sections	10	0	0	...	11	0	0
Steel Compound Stanchions	12	10	0	...	13	10	0
Angles, Tees, and Channels, ordinary sections	9	15	0	...	10	15	0
Flitch Plates	9	15	0	...	10	15	0
Cast Iron Columns and Stanchions including ordinary patterns	8	0	0	...	9	0	0

METALS.

	Per ton, in London. £	s.	d.		£	s.	d.
IRON— Common Bars	8	10	0	...	9	0	0
Staffordshire Crown Bars, good merchant quality	9	5	0	...	9	15	0
Staffordshire "Marked Bars"*	11	0	0	...		—	
Mild Steel Bars	9	10	0	...	9	15	0
Hoop Iron, basis price	9	15	0	...	10	0	0
,, ,, Galvanised	17	10	0	...		—	

(*And upwards, according to size and gauge.)

Sheet Iron Black— Ordinary sizes to 20 g.	10	0	0	...		—	
,, ,, 24 g.	11	0	0	...		—	
,, ,, 26 g.	12	10	0	...		—	
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	16	0	0	...		—	
Ordinary sizes to 22 g. and 24 g.	16	10	0	...		—	
,, ,, 26 g.	17	0	0	...		—	
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	19	0	0	...		—	
,, ,, 22 g. and 24 g.	19	10	0	...		—	
,, ,, 26 g.	21	0	0	...		—	
Galvanised Corrugated Sheets— Ordinary sizes 6 ft. to 8 ft. 20 g.	16	0	0	...		—	
,, ,, 22 g. and 24 g.	16	5	0	...		—	
,, ,, 26 g.	17	10	0	...		—	
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	13	0	0	...		—	
Best Soft Steel Sheets, 22 g. & 24 g.	14	0	0	...		—	
,, ,, 26 g.	16	0	0	...		—	
Cut Nails, 3 in. to 6 in.	10	15	0	...	11	5	0

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London. £	s.	d.		£	s.	d.
*LEAD—Sheet, English, 3lb. and up.	17	10	0	...		—	
Pipe in coils	18	0	0	...		—	
Soil pipe	20	10	0	...		—	
Compo pipe	21	10	0	..		—	
ZINC—Sheet— Vieille Montagne ton	29	0	0	...		—	
Silesian	28	15	0	...		—	
COPPER— Strong Sheet per lb.	0	1	2	...		—	
Thin ,, ,,	0	1	3	...		—	
Copper nails ,,	0	1	1	...		—	
BRASS— Strong Sheet ,,	0	1	0	...		—	
Thin ,, ,,	0	1	1	...		—	
TIN—English Ingots ,,	0	1	5	...		—	
SOLDER—Plumbers' ,,	0	0	8	...		—	
Tinmen's ,,	0	0	10	...		—	
Blowpipe ,,	0	1	0	...		—	

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

15 oz. thirds	2½d.	per ft.	delivered
,, fourths	1⅞d.	,,	,,
21 oz. thirds	3⅛d.	,,	,,
,, fourths	2⅜d.	,,	,,
26 oz. thirds	4¼d.	,,	,,
,, fourths	3¼d.	,,	,,
32 oz. thirds	5d.	,,	,,
,, fourths	4⅛d.	,,	,,
Fluted Sheet, 15 oz.	3⅛d.	,,	,,
,, 21 oz.	4⅛d.	,,	,,

* Owing to an accident the price of lead was not corrected last week. [Basis price for sheet lead should have been £18 15

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

⅛ Hartley's	2½d.	per ft.	del.vered
¼ ,,	2¾d.	,,	,,
½ ,,	3d.	,,	,,
Figured and Oxford Rolled "Oceanic" Glass, white ...	4d.	,,	,,
Do. ,, tinted ...	5½d.	,,	,,

OILS, &c.

		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	2	1
,, ,, ,, in barrels	,,	0	2	2
,, ,, ,, in drums	,,	0	2	3
Boiled ,, ,, in pipes	,,	0	2	2
,, ,, ,, in barrels	,,	0	2	3
,, ,, ,, in drums	,,	0	2	4
Turpentine in barrels	,,	0	3	0
,, in drums	,,	0	3	2
Genuine Ground English White Lead	per ton	26	0	0
Red Lead, Dry	,,	25	0	0
Best Linseed Oil Putty	per cwt.	0	7	0
Stockholm Tar	per barrel	1	12	0

VARNISHES, &c.

	Per gallon. £	s.	d.
Fine Pale Oak Varnish	0	8	0
Pale Copal Oak	0	10	6
Superfine Pale Elastic Oak	0	12	6
Fine Extra Hard Church Oak	0	10	0
Superfine Hard-drying Oak, for seats of Churches	0	14	0
Fine Elastic Carriage	0	12	6
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple	0	16	0
Finest Pale Durable Copal	0	18	0
Extra Pale French Oil	1	1	0
Eggshell Flatting Varnish	0	18	0
White Copal Enamel	1	4	0
Extra Pale Paper	0	12	0
Best Japan Gold Size	0	10	
Best Black Japan	0	16	
Oak and Mahogany Stain	0	9	
Brunswick Black	0	8	0
Berlin Black	0	16	0
Knotting	0	10	0
French and Brush Polish	0	10	6

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. The Editor cannot undertake to read and consider articles offered for acceptance unless they are type-written.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

TENDERS.

*** Owing to the Christmas Holidays, the *Builder* will be published next week on Tuesday instead of Friday. All communications for the Editor must therefore reach our office by first post on Monday, the 23rd inst.

* Denotes *accepted*. † Denotes *provisionally accepted*.

ALDERSHOT.—For rebuilding the Princess Hotel, Union-street, for Messrs. Crowley & Co., Ltd., brewers, Alton, Hants. Messrs. Friend & Lloyd, architects and surveyors, Grosvenor-road, Aldershot:—

R. Cook & Sons	£3,600	G. Kemp	£2,849
Martin, Wells, & Co.	3,050	W. J. Snuggs	2,809
W. L. Edgoose	3,039	Crosby & Co., Farnham*	2,449
Poulter Bros.	2,985		
F. Knight	2,850		

ASHFORD (Kent).—For painting and repairs to buildings for the Urban District Council. Mr. W. Terrill, Surveyor, North-street, Ashford:—

H. J. Barwick	£142 3 0	W. Baker & Co.	£108 2 6
J. B. Wood	121 0 0	G. Newton	106 12 0
Sturrey Building Co	117 10 0	J. Masters	87 2 6
W. Masters & Sons	112 12 11	W. E. Bowles & Sons, Ashford*	80 1 0

BARGOED.—For extensions, etc., to Bargoed Girls' Council School, for the Glamorgan County Education Committee. Mr. D. Pugh Jones, F.S.I., County Architect (Eastern Division), Cardiff. Quantities by County Architect's Department:—

W. Williams & Sons, Bargoed, Glamorgan* .. £5,347

BARRY.—For a temporary school, Barry County School, for the Glamorgan County Education Committee. Mr. D. Pugh Jones, F.S.I., County Architect, Cardiff. Quantities by County Architect's Department:—

Superstructure.

J. Harrison & Co., London* £390

Substructure.

W. Britton, Barry* 151

BATH.—For addition to the Capital and Counties Bank, Bath. Mr. H. W. Matthews, architect, Bath:—

Erwood & Morris	£1,695	Wills & Sons	£1,529
Hayward & Wooster	1,689	Long & Sons	1,490

BATH.—For new shop-front to No. 3, Quiet-street, Bath. Mr. H. W. Matthews, architect, Bath:—

J. Long & Sons	£296 0	Cotterell Bros.	£287 14
Hayward & Wooster	290 10	Wills & Sons	287 0
		Erwood & Morris	275 0

BEVERLEY.—For sinking and boring well for the Corporation. Mr. Baldwin Latham, M.Inst.C.E., Parliament-mansions, Victoria-street, Westminster, S.W.:—

	Lining of the Well with Brickwork.	For Lining with Steel Cylinders.
G. Lawson	£3,902 0 0	£3,611 0 0
C. Williamson & Co.	2,720 0 0	2,920 0 0
J. Villiers, Grovebill-road, Beverley*	2,257 7 3	2,369 17 4
I. Sangwin	2,187 11 6	2,313 4 4
C. Chapman & Sons	2,178 3 6	1,919 9 3
A. E. Nunn	1,965 14 10	2,208 3 10
W. I. Knox	1,959 16 8	2,389 11 4
C. Chamberlain	1,955 0 0	2,001 0 0
T. Tilley & Sons, Ltd.	1,838 9 3	1,886 19 10
R. H. B. Neal, Ltd.	1,762 7 0	1,944 1 4
Johnson & Langley	1,727 18 3	2,068 8 9
W. Crossland	1,546 10 8	1,659 16 9
J. Mackay	1,153 17 9	1,298 9 1

BIRMINGHAM.—For the extension of the Council House buildings (first Contract), comprising work up to level of upper ground floor. Messrs. H. V. Ashley & Winton Newman, architects, 14, Gray's Inn-square. Quantities by Mr. Anthony Rowse, King's Court, 117, Colmore-row, Birmingham, and Mr. Hugh Watkins, 12, Gray's Inn-square, W.C.:—

		Extra for Granite in lieu of Darley Dale stone.
G. P. Trentham	£33,935	£2,053
D. Frith	33,378	200
W. Cunliffe	32,600	2,000
H. C. Clifton	32,470	1,470
T. Fish & Sons	32,350	1,900
A. C. Hughes	32,292	2,064
D. W. Davies	32,190	2,077
J. Dallow & Sons	31,500	1,500
W. E. Blake	31,000	1,693
Musselwhite & Sapp	30,328	2,430
Pattinson & Sons, Ltd.	29,850	2,000
W. Sapcote & Sons	29,755	1,500
T. Johnson	29,703	1,939
H. Willcock & Co.	29,612	2,555
H. Lovatt Ltd.	29,285	1,310
R. Fenwick, Ltd.	28,970	3,799
W. Bishop	28,849	3,499
J. Parnell & Sons	28,500	2,875
J. H. Harper	27,990	3,000
J. Bowen & Sons	27,646	3,276
W. & J. Webb	27,475	2,890
B. Whitehouse & Sons	27,441	1,650
Waring White Building Co.	27,190	2,900
T. Lowe & Sons	26,990	2,990
J. Barnsley & Sons	26,666	3,000
W. Moss & Sons, Ltd.	26,250	2,260
T. Rowbotham‡	25,877	2,916
W. Hopkins	25,000	2,220
Architect's estimate	28,700	1,900

‡Recommended for acceptance.

BROADSTAIRS.—For erecting a public convenience at Clarendon-road, for the Broad-stairs and St. Peter's Urban Council. Mr. Hurd, C.E, Town Surveyor, Council Offices, Broadstairs:—

E. G. Holbourn	£85 0	R. S. Goodburn, Clarendon-road, Broadstairs*	£69 17
G. Chesswass	84 10		
A. Dyke	83 10	E. R. Dunn	64 15
G. Miriams	78 0		
A. E. Goodburn	77 0		

CHEADLE.—For private street works, Cuthbert-road, Holmes-street, Platt-street, and Maple-avenue, for the Urban District Council of Cheadle and Gatley. Mr. E. Sykes, A.M.Inst.C.E., Council Offices, Cheadle, near Manchester:—

Gosling & Stafford, London-road, Hazel Grove £1,408 14 5

CLAYGATE.—For making up parts of Beaconsfield-road and Claremont-road, for the Urban District Council of Esher and the Dittons. Mr. Horace C. Fread, Surveyor to Council. Quantities not supplied:—

Griffiths & Co.	£1,335	Free & Son	£1,140
James & Co.	1,333	Kavanagh & Co., Surbiton Hill*	1,087
Ingram & Co.	1,220	J. May	936
Atkins & Co.	1,200		
T. Adams	1,191		

DARTMOUTH.—For erection of new post-offices South-parade, Dartmouth, for Mr. Hayne Smith. Mr. E. H. Back, architect and surveyor, Dartmouth:—

Yeo & Sons	£1,939 0 0	R. C. Pillar	£1,390 0 0
H. Drew	1,890 0 0	R. Watts	1,379 0 0
G. Webber	1,644 10 0	R. T. Pillar	1,367 0 0
A. E. Knight	1,585 3 1	Ferris & Heydon, Dartmouth*	1,350 1 10
F. W. Gullett	1,493 5 0		
W. G. Row	1,450 0 0		
H. Anderson	1,418 0 0		

DARTMOUTH.—For erection of two houses at Townstal, Dartmouth, for Mr. Philip Beable. Mr. E. H. Back, architect and surveyor, Dartmouth. Quantities by architect:—

F. W. Gullett	£656 0 0	H. Anderson	£595 12 0
R. Watts	627 0 0	Maunder & Brad	591 5 0
Ferris & Heydon	602 17 2	A. E. Knight*	550 0 0
J. T. Triggs	593 0 0		

[All of Dartmouth.]

DEVONPORT.—For levelling, paving etc., lane between Hornby-street and Ryder-road, for the Corporation. Mr. J. F. Burns, Borough Surveyor, Municipal Offices, Ker-street, Devonport:—

T. Doney	£142 14 6	Jefford & Sons, St. Budeaux*	£122 14 8
Pethick Bros.	139 17 0		
J. Snawdon & Sons	132 3 4		

DEVONPORT.—For levelling, paving, etc., lane between Hornby and Phillimore streets, for the Corporation. Mr. J. F. Burns, Borough Surveyor, Municipal Offices, Ker-street, Devonport:—

T. Doney	£167 18 9	Jefford & Sons St. Budeaux*	£124 15 0
Pethick Bros.	141 1 0		
J. Snawdon & Sons	134 6 2		

DEVONPORT.—For levelling, paving, etc., lane between Fairfax terrace and Phillimore-street, for the Corporation. Mr. J. F. Burns, Borough Surveyor, Municipal Offices, Ker-street, Devonport:—

J. Snawdon & Sons	£147 12 2	T. Doney	£136 11 10
Pethick Bros.	145 8 0	Jefford & Sons. St. Budeaux*	127 12 10

DEVONPORT.—For levelling, paving etc., lane at side of Nos. 8 and 9, Fairfax-terrace, for the Corporation. Mr. J. F. Burns, Borough Surveyor, Municipal Offices, Ker-street, Devonport:—

J. Snawdon & Sons	£76 2 0	Jefford & Sons, St. Budeaux*	£65 17 2
Pethick Bros.	74 19 0		
T. Doney	70 1 6		

EBBW VALE.—For road improvements, Mount-street, for the Urban District Council. Mr. T. J. Thomas, Engineer and Surveyor, Ebbw Vale:—

Ebbw Valley Building Co., Ltd., Victoria, near Ebbw Vale £197 18 3

ELLAND.—For alterations to the Town Hall Hotel. Messrs. S. Jackson & Son, architects, etc., 11, Tanfield-chambers, Bradford:—

Mason's Work: Marshall & Rushworth, Park-road, Elland* £175 0
Joiner's Work: J. & E. Crowther Bros., Portland-street, Elland* 80 0
Plumber's Work: J. D. Peel, Church-street, Elland* 24 5
Slater and Plasterer's Work: T. H. Wadsworth, Westgate, Elland* 16 7

FLITWICK (Beds.).—For the erection of house. Mr. H. G. Cole, surveyor, Alexandra-place, Bedford:—

Warton & Dunstall	£495 0 0	Richardson & Putman	£456 15 0
E. Martin	475 7 6	G. Botsford	449 0 0
C. Negus	465 0 0	W. T. Sharpe*	449 0 0

GILFACH FARGOED.—For the erection of a new infants' school at Gilfach Fargoed, for the Glamorgan County Education Committee. Mr. D. Pugh-Jones, F.S.I., County Architect (Eastern Division), Cardiff. Quantities by the County Architect's Department:—

F. Bond, Beda-road, Cardiff* £2,890 2 4

HORTON ASYLUM.—For provision of verandahs to infirmary wards, for the London County Council:—

British Challenge Glazing Co., Ltd.* £336

LEYTON.—For cleansing, painting, and repairs to two schools, for the Education Committee. Mr. W. Jaques, A.R.I.B.A., 2, Fen-court, Fenchurch-street, E.C.:—

	Cann Hall-road	Church-road.
Barrett & Power	£427 0 0	£270 0 0
Brown & Son	569 3 0	601 19 3
Bruton & Son	330 0 0	320 0 0
A. E. Clark	—	309 0 0
W. J. Clemens	330 0 0	250 0 0
Clemens Bros.	299 10 0	—
F. J. Coxhead	266 0 0	256 0 0
J. Fenn Scott	288 16 0	359 6 3
Fox & Sons	390 0 0	408 0 0
J. W. Holmes	259 0 0	280 0 0
A. E. Hubbard	255 0 0	283 0 0
W. Hussey	435 0 0	335 0 0
Hocking & Co.	333 0 0	296 0 0
J. Johnson	—	—
L. Kazik, Belvedere*	173 0 0	194 10 0
M. McCarthy	209 0 0	290 0 0
P. McCarthy	211 0 0	297 0 0
Measor & Son	352 2 9	411 10 2
Newmans	330 0 0	265 10 0
E. Partridge	284 19 0	—
W. R. Power	402 4 0	—
Richards & Son	258 10 0	198 12 0
C. J. Sherwood	342 0 0	298 0 0
C. Sims	275 0 0	410 0 0
G. H. Smith	292 0 0	—
Stevens & Sons	328 0 0	224 0 0
Vigor & Co.	297 10 0	248 0 0
J. Wick	378 0 0	342 0 0
C. Wilson‡	—	—
H. Wood	433 0 0	—
Wood Bros.	308 15 0	229 10 0
Woollaston Bros.	305 0 0	240 0 0
Woollaston & Co.	210 0 0	215 0 0

‡ Withdrawn.

LONDON.—For Broomwood-road secondary schools, Clapham, for the London County Council:—

J. Marsland & Sons	£29,080 0 0
W. Downs	28,593 0 0
H. Lovatt, Ltd.	28,573 9 6
J. Appleby & Sons	28,560 0 0
Holloway Bros. (London), Ltd.	28,077 0 0
J. Carmichael	27,916 0 0
J. Garrett & Son	27,856 0 0
J. & C. Bowyer	27,685 0 0
W. Smith & Son	27,548 0 0
G. E. Wallis & Sons, Ltd.	27,337 0 0
C. Wall, Ltd.	27,030 17 0
L. Whitehead & Co., Ltd.	26,900 0 0
E. Lawrance & Sons	26,875 0 0
W. Johnson & Co., Ltd.	26,858 0 0
T. D. Leng	26,855 0 0
J. Smith & Sons, Ltd.	26,753 0 0
Waring White Building Co., Ltd.	26,640 0 0
W. Moss & Sons, Ltd.	26,573 10 3
J. & M. Patrick	26,193 0 0
Holliday & Greenwood, Ltd., Loughborough-park Works, Brixton‡	25,919 0 0

[The estimate of the Architect (Education), comparable with the tenders, is £27,038.]

‡Recommended for acceptance.

LONDON.—For supply of special trackwork, Hammersmith to Harlesden tramways, for the London County Council:—

E. Allen & Co., Ltd.	£1,773 0 0
Hadfield's Steel Foundry Co., Ltd., Sheffield*	1,666 12 6

[Chief Engineer's estimate, comparable with the above tenders, is £1,650 5s.]

LONDON.—For heating school, Thomas-street, Lime house, for the London County Council:—

J. Grundy* £427

LONDON.—For heating school, Rushmore-road Hackney, S., for the London County Council:—

G. & E. Bradley* £311

LONDON.—For adapting the premises No. 8, Bell-street, as a housewifery centre in connexion with the Bell-street school, Marylebone, W., for providing lavatory, cloakroom, water-closet, etc., and for adding a portion of the yard to the boys' playground, for the London County Council:—

H. Eady* £360 14 4

LONDON.—For repairs to schools on schedule of prices, for the London County Council:—

Maxwell Bros., Ltd., for groups 1 and 2 of the Woolwich county electoral division, with the addition of (i.) 12½ per cent. for repairs (measured work), (ii.) 15 per cent. for sanitary (measured work), and (iii.) 10 per cent. for daywork generally.

LONDON.—For alterations to school, Gillespie-road, Islington, E., for the London County Council:—

McLaughlin & Harvey, Ltd.* £270

LONDON.—For supply of flat-bottomed rails and fastenings, Bow, Hammersmith, and Hackney car-sheds, for the London County Council:—

Cammell, Laird, & Co., Ltd.	£1,262 0 0
W. Scott, Ltd.	1,135 6 3
Steel, Peech, & Tozer, Ltd.	1,134 16 10
Barrow Hæmatite Steel Co., Ltd.	1,044 4 9
Bolckow, Vaughan, & Co., Ltd.	1,091 15 0
P. & W. MacLellan, Ltd., Glasgow*	1,072 18 9

[Messrs. P. & W. MacLellan, Ltd., to be allowed to sub-let to the undermentioned firms the following portions of the work specified, namely, to the Barrow Hæmatite Steel Co., Ltd., the manufacture of the rails, and to Guest, Keen, & Nettlefolds, Ltd., the manufacture of the bolts and nuts.]

LONDON.—For supply of steel underframes for fifty car-bodies, for the London County Council:—

Mountain & Gibson, Ltd.	£2,402 10
United Electric Car Co., Ltd.	2,300 0
De Bergue & Co., Ltd.	2,287 10
G. R. Turner, Ltd.	2,275 0
Heenan & Froude, Ltd.	2,150 0
Hurst, Nelson, & Co., Ltd., Motherwell*	1,975 0

LONDON.—For roadwork and platelaying, etc., Hammersmith to Harlesden tramways, for the London County Council:—

—	Tramway Works.	Paving Works for Street Widenings.	Total.
	£ s. d.	£ s. d.	£ s. d.
J. Moran & Son, Ltd.	45,962 1 0	7,899 10 6	53,861 11 6
W. Muirhead & Co.	43,818 1 10	8,304 0 11	51,662 2 9
Fry Bros.	41,434 10 7	8,656 14 9	50,091 5 4
J. G. White & Co., Ltd.	41,751 16 0	7,284 14 10	49,036 10 10
E. Nuttall & Co.	40,472 19 10	6,530 9 1	47,003 8 11
National Electric Construction Co., Ltd.	39,170 15 10	7,416 16 2	46,587 12 0
W. Griffiths & Co., Ltd.	39,536 8 7	6,898 7 2	46,434 15 9
J. Mowlem & Co., Ltd.	40,164 1 4	6,229 6 5	46,393 7 9
R. W. Blackwell & Co., Ltd.	36,577 8 4	6,772 13 6	43,350 1 10
G. Law	34,332 13 6	8,560 8 4	42,890 6 10
W. Underwood & Bro.	36,694 7 11	6,142 19 11	42,837 7 10
W. Manders	34,381 16 10	6,235 13 8	40,617 10 6
G. Hay & Co.	33,936 14 4	6,443 8 1	40,380 2 5
Dick, Kerr, & Co., Ltd.	33,814 7 10	6,338 19 0	40,153 6 10
G. Wimpey & Co., Hammersmith*	32,685 10 3*	6,392 12 11	39,078 3 2

[The Chief Engineer's estimates, comparable with the tenders, are £39,839 11s. 8d. for tramway works and £7,587 12s. 2d. for street improvement works, or a total of £47,407 3s. 10d. Provisional sums of £2,500 and £1,600 respectively are included in each of the tenders for alterations of pipes, mains, etc.]

[Messrs. G. Wimpey & Co. to be allowed to sub-let to the undermentioned firms (or to such other persons or firms as may be approved by the Chief Engineer under the contract) the following portions of the work, namely—(i.) to Messrs. Bayliss, Jones, & Bayliss the supply of tie bars and bolts, and (ii.) to Messrs. J. B. Lee & Son the supply of the creosoted deal blocks.]

SOUTHALL—NORWOOD.—For paving, kerbing, and channelling works, Western-road, Church-path, South-road, and The Green, for the Urban District Council. Mr. R. Brown, Engineer and Surveyor, Public Offices, Southall:—

—	Paving Works.	Lea-road (part of).	Adelaide-road (part of).	Talbot-road.	Endsleigh-road (part of).	Gordon-road.	Inverness-road (part of).
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
T. Adams	1,412 2 1	162 1 3	754 15 10	483 3 10	252 2 4	839 5 1	640 2 11
A. & B. Hanson, Southall*‡	1,308 0 0	131 0 0	629 0 0	409 0 0	208 0 0	722 0 0	538 0 0
F. G. Porter	1,372 2 5	143 14 4	687 4 10	437 14 11	233 8 1	768 19 10	584 5 3
T. Watson, jun.	1,566 2 5	174 11 3	796 14 6	500 16 7	270 15 5	863 19 7	657 8 2
T. Free & Son	1,364 13 3	149 6 7	688 16 2	447 9 0	229 3 0	775 16 6	580 2 0
G. Porter	1,506 7 3	163 12 8	795 13 2	509 4 0	256 10 9	880 17 10	665 15 9
H. Morecroft	1,460 0 0	156 0 0	762 0 0	488 0 0	247 0 0	860 0 0	637 0 0
A. T. Catley	1,424 10 0	176 17 4	782 15 0	489 12 0	238 17 0	840 0 0	660 0 0
W. E. Rhodes	—	149 0 0	730 0 0	463 7 6	228 0 0	815 13 0	613 10 0
E. J. Burt	1,394 0 0	—	—	—	—	—	—
Mowlem & Co.	—	153 0 0	694 0 0	449 0 0	245 0 0	785 0 0	589 0 0
S. Gibbons	—	134 0 10	639 6 1	416 19 3	208 18 10	729 5 0	536 16 8
Engineer's Estimates	1,247 15 4	136 7 5	647 0 2	370 9 0	217 17 11	717 11 0	540 9 9

‡ All subject to approval of Local Government Board.

LONDON.—For the supply of track-rails, etc., for the London County Council:—

Cammell, Laird & Co., Ltd.	£15,579 10 0
Steel, Peech, & Tozer, Ltd.	14,444 10 0
Lorain Steel Co., U.S.A.	14,207 10 6‡
Barrow Hæmatite Steel Co., Ltd.	13,262 12 6
P. & W. MacLellan, Ltd.	13,119 18 9
Bolckow, Vaughan, & Co., Ltd.	12,893 0 0
W. Scott, Ltd., Hunslet, Leeds*	11,546 0 0

[The Chief Engineer's estimate, comparable with the above tenders, is £12,137. The effect of additions to the proposed contract will be to increase the expenditure thereunder from £11,546 to about £19,691. W. Scott, Ltd., to be allowed to sub-let to the undermentioned firms the following portions of the work referred to, namely—(i.) to the Coghlan Steel & Iron Co., of Hunslet, Leeds, the rolling of the fishplates; and (i.) to Guest, Keen, & Nettlefolds, Ltd., of Birmingham, the supply of the bolts and lock-nuts.]

‡ Not to specification.

LONDON.—For making new roads and laying drains from Acton-lane to Workhouse-buildings at Acton-lane, Willesden, N.W. Mr. A. Saxon Snell, F.R.I.B.A., 22, Southampton-buildings, Chancery-lane, W.C.:—

T. Bendon, Ltd.	£1,140 0 0	A. J. Catley	£ 620 0 0
W. Griffiths & Co., Ltd.	781 15 9	F. Fowles & Co., Ltd.	600 0 0
F. & E. Davey, Ltd.	677 0 0	Edwards & Co.	595 0 0
S. Kavanagh & Co.	669 0 0	F. G. Brummell	590 0 0
T. Adams	638 0 0	Willis & Powis, Sudbury, Middlesex*	464 0 0
C. Ford	637 0 0		

LOUGHTON.—For the erection of a continuous bacterial filter, for the Urban District Council. Mr. Horace White, District Surveyor and Engineer, Loughton:—

D. T. Jackson	£1,496	W. & C. French	£1,335
Parsons & Parsons	1,473	E. E. Winch, Loughton*	1,169
W. Manders	1,475		
G. Bell & Sons, Ltd.	1,467		

NORWICH. — For the erection of Wensum-view Council School, for the City Council. Mr. C. J. Brown, architect and surveyor, Cathedral Offices, The Close, Norwich:—

Downing & Sons	£10,995	W. J. Hannant	£10,250
J. S. Smith	10,886	T. Gill	9,946
Searles Bros.	10,650	Spencer, Santo, & Co.	9,850
J. Youngs & Son	10,464	J. Hurn, Norwich*	9,790
H. C. Greengrass	10,457	W. Clark & Son	9,279
G. E. Hawes	10,452		

PLYMOUTH.—For new water mains at the workhouse premises, for the Guardians. Messrs. Thornely & Rooke, architects, 11, The Crescent, Plymouth:—

S. Roberts, Ltd.	£348 0 0	J. Shaddock, Mutley, Plymouth*	£296 0 0
W. C. Shaddock	311 11 8		
T. Shaddock	304 10 0		

ST. ATHANS.—For alterations and additions, etc., St. Athans Council School, for Glamorgan Education Committee. Mr. D. Pugh Jones, F.S.I., County Architect, Cardiff. Quantities by County Architect's Department:—

W. Britton, Barry*	£850 0 0

SOUTHWICK.—For extension of sewers in Cross-road and Church-lane, for the Urban District Council. Mr. G. W. Warr, Surveyor to the Council, Town Hall, Southwick, Sussex:—

W. Holman & Co.	£409 6 9	W. A. Mackeller	£277 0 0
W. Swales	328 12 7	Bostel Bros., Duke-street, Brighton*	273 0 0
Burstow & Sons	325 0 0		
Parsons & Sons	299 0 0		
Woolgar Bros.	286 19 0		

TONGWYNLAIS.—For the erection of a new Council school at Tongwynlais, near Cardiff, for the Glamorgan County Education Committee. Mr. D. Pugh-Jones, F.S.I., County Architect (Eastern Division), Cardiff. Quantities by County Architect's Department:—

S. Shail, Llandaff North, near Cardiff*	£4,253 10 4

WATERLOO (Blyth).—For resewering and paving part of Back Bowes-street, for the Urban District Council. Mr. R. Grieves, Surveyor to the Council, Seaforth-street, Waterloo, Blyth:—

G. E. Simpson.	£265 15 11	J. McLaren	£221 3 0
Henderson & Son	237 17 7	J. Robson, Newcastle-on-Tyne*	211 13 10
M. McKinnon	233 18 6		

WHITLEY.—For sewerage works, for Whitley and Monkseaton Urban District Council. Mr. J. Moore, Surveyor, Council Buildings, Whitley Bay:—

G. Thornton & Co., South Shields.	Schedule of prices.

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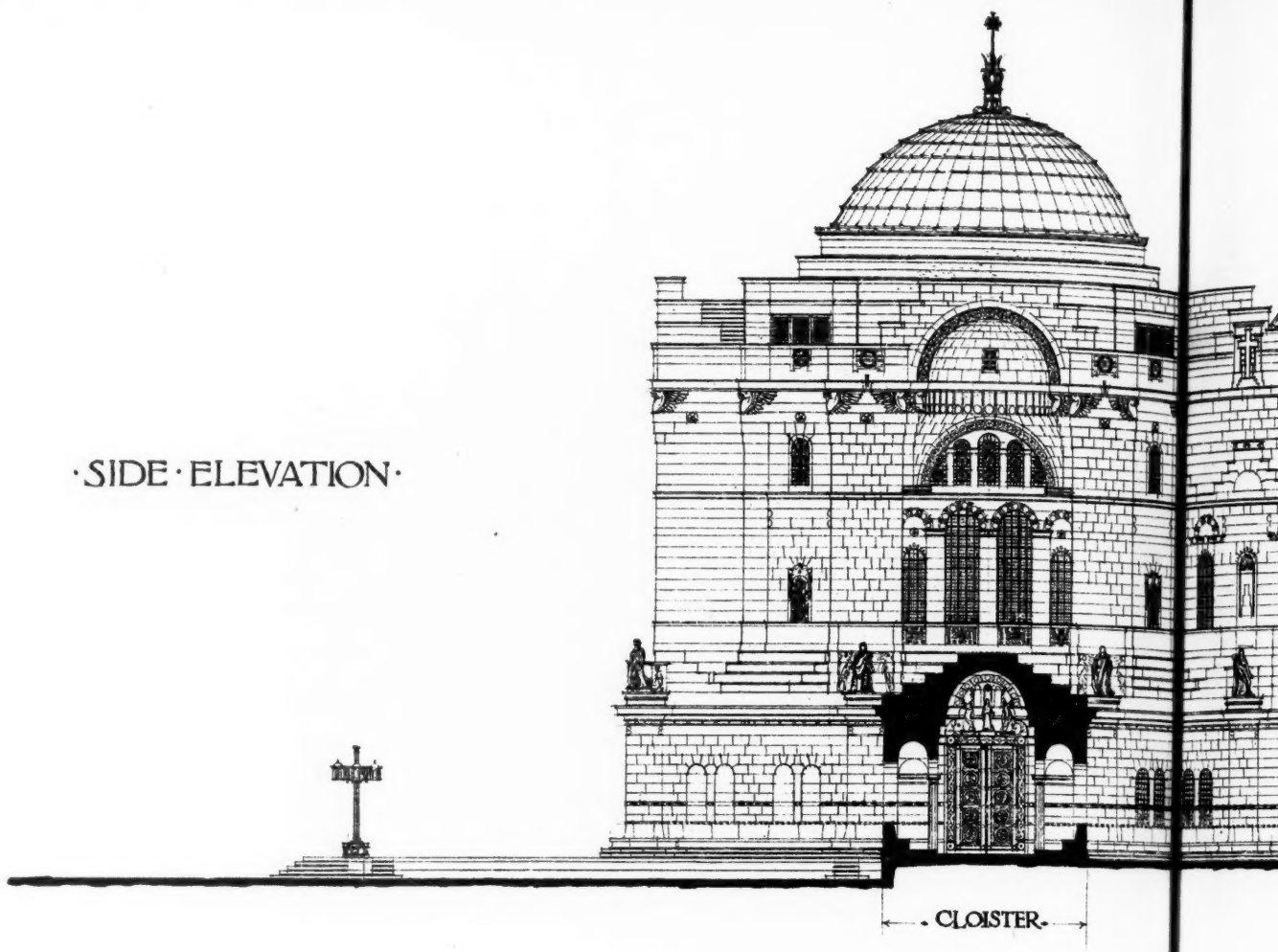
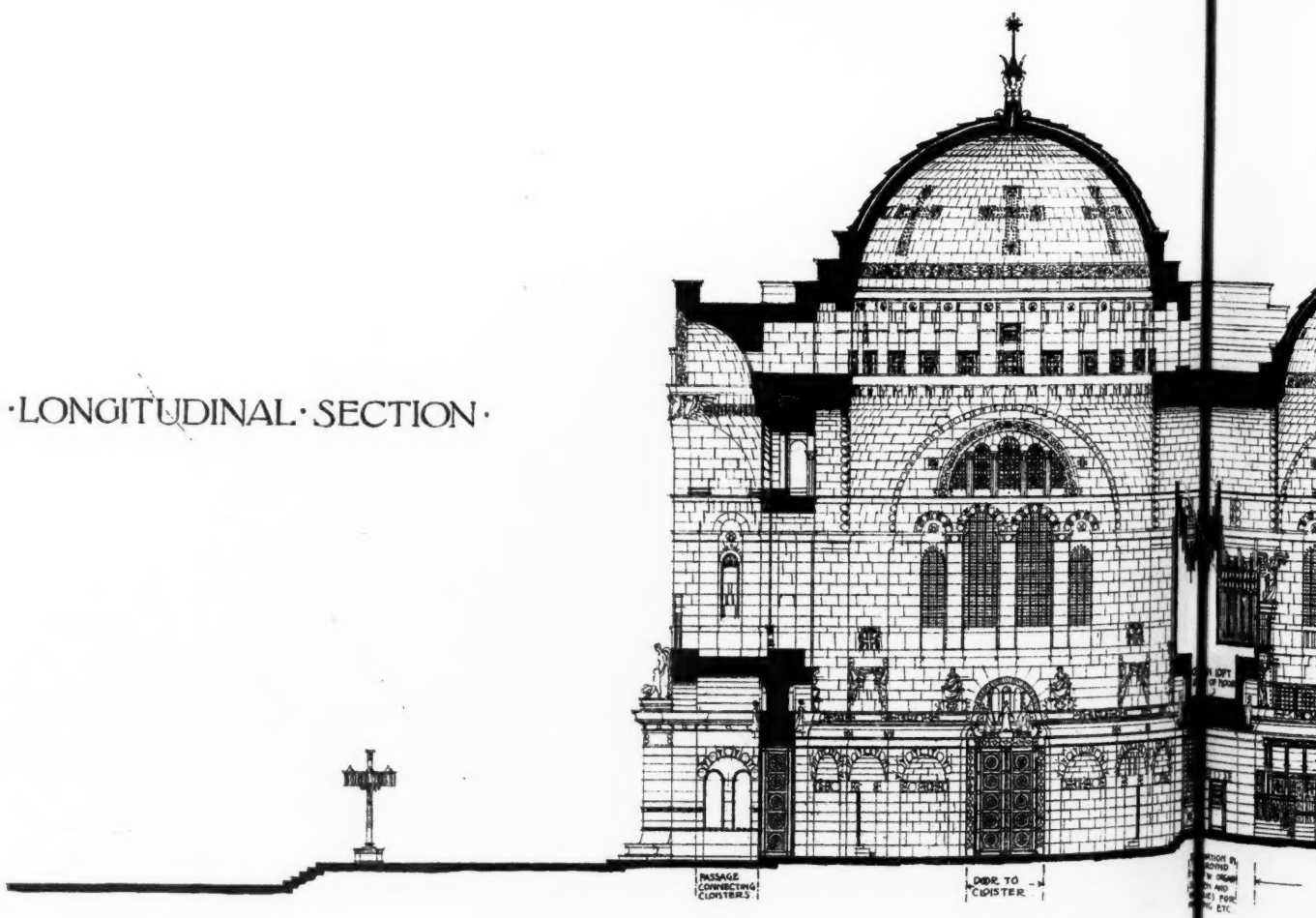
·SIDE·ELEVATION·



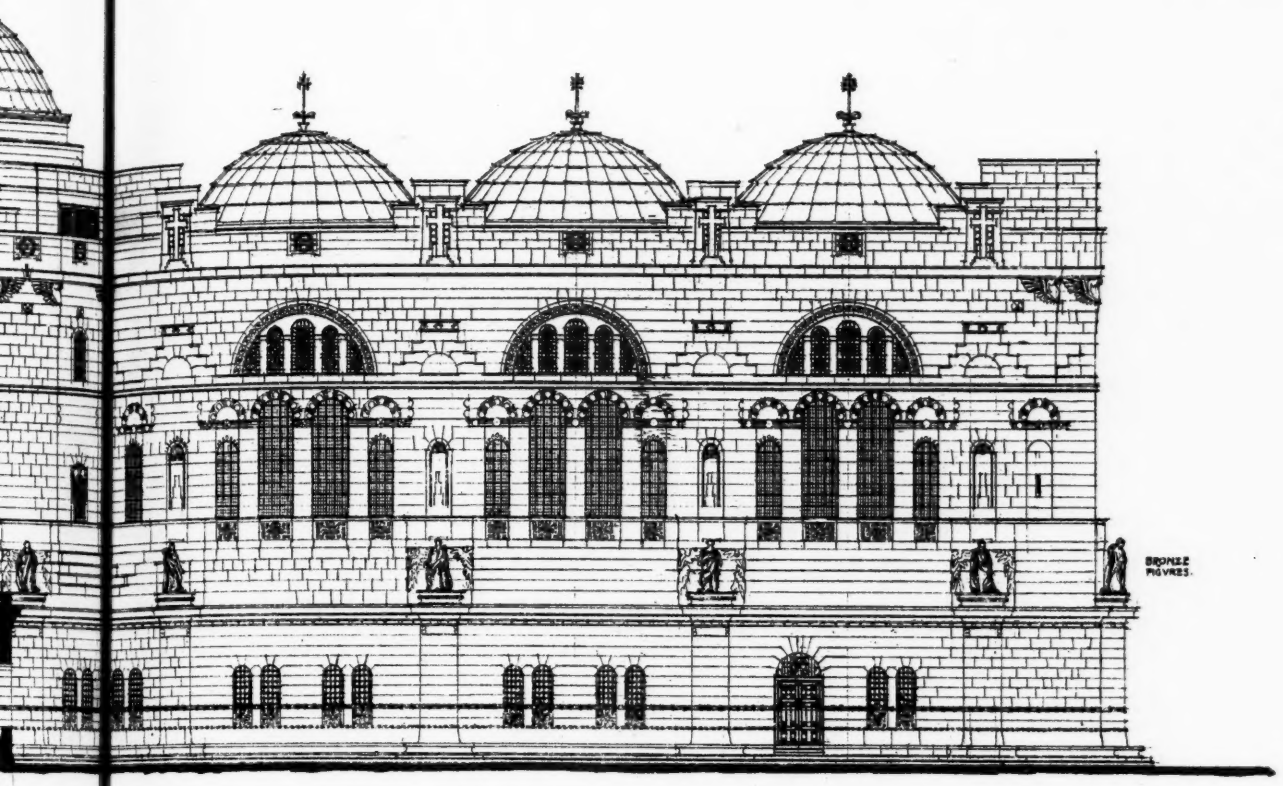
·LONGITUDINAL·SECTION·

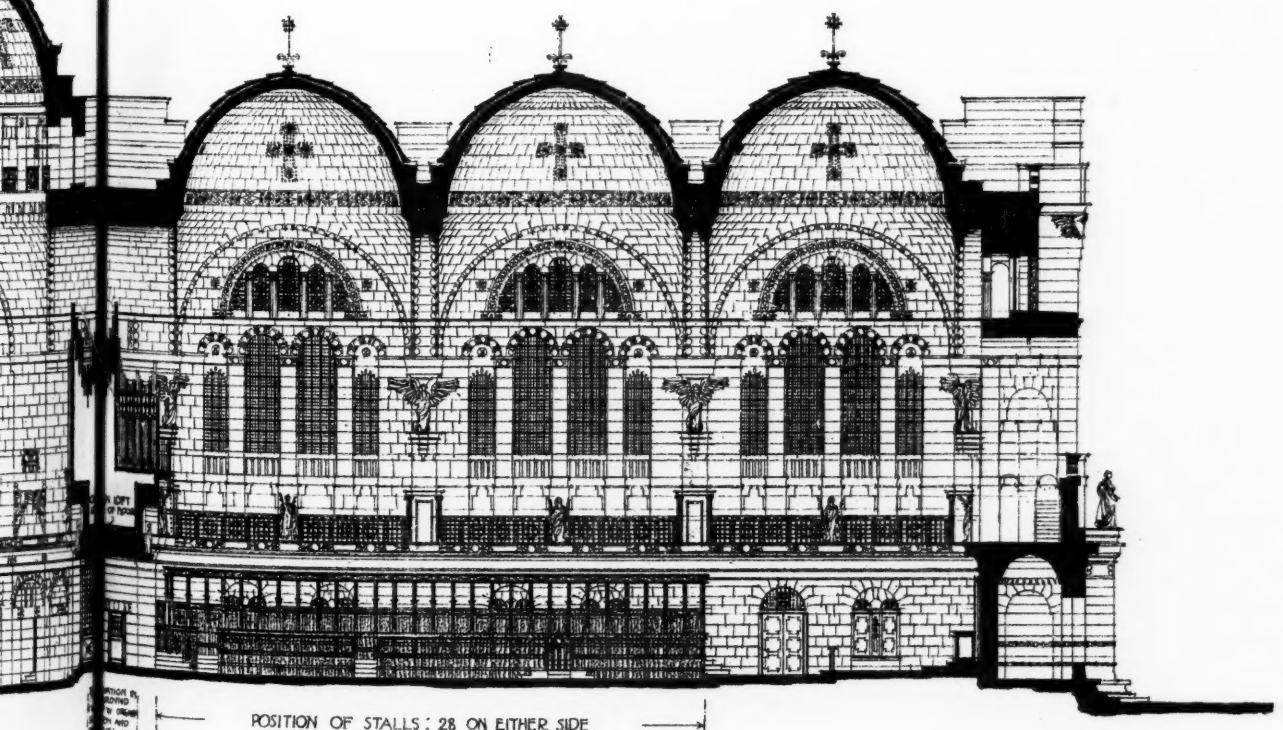


SCALE OF [illegible] FEET

DESIGN FOR A COLLEGE CHAPEL.—By Mr

(Royal Academy Travelling Studentship, 1907.)





FEET

COLLEGE CHAPEL.—By Mr. W. Harvey.

"INK-PHOTO" SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

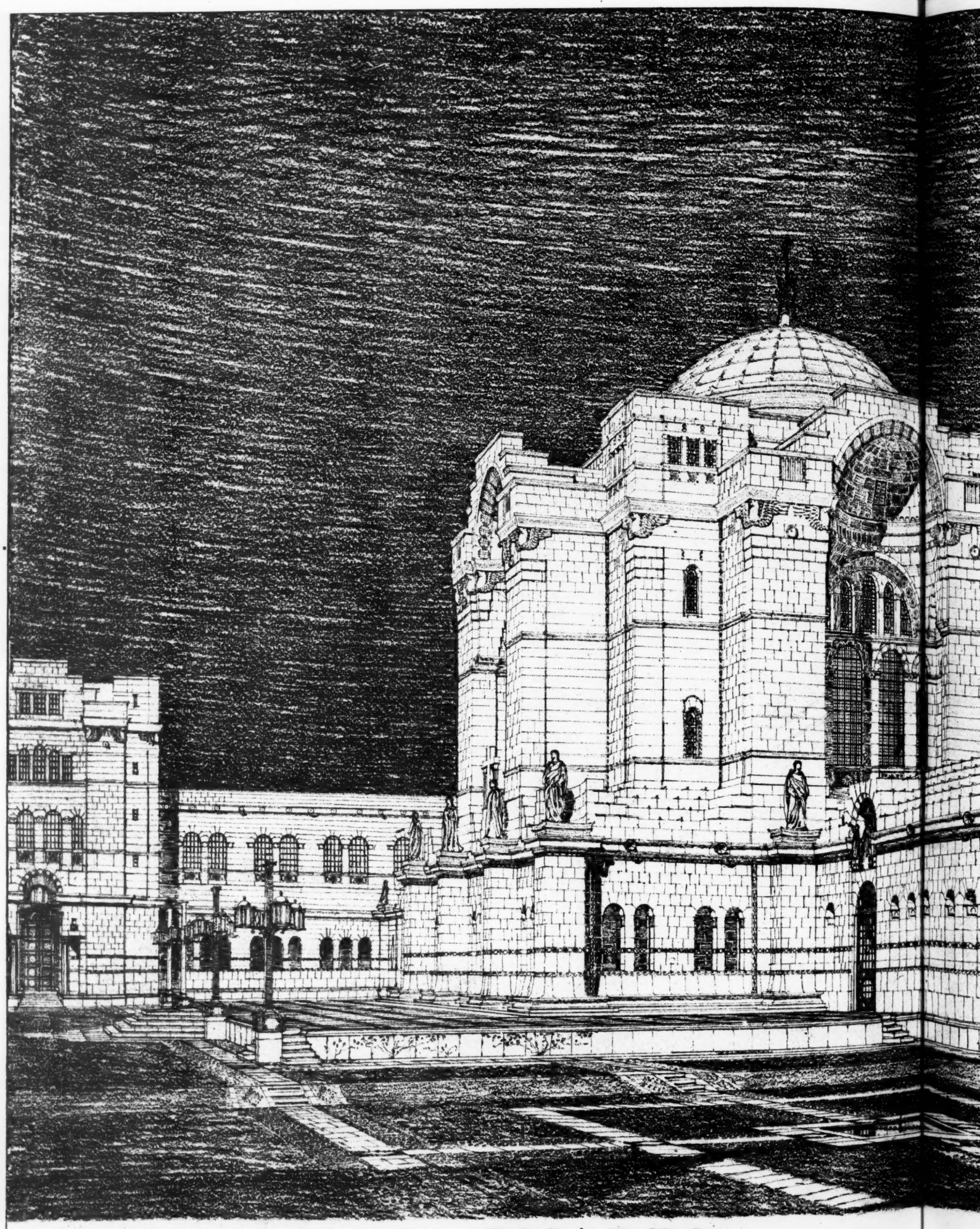
POLYHYMNIA
MUSE
OF·SINGING
AND·RHETORIC

INK PHOTO SPRAGUE & C° LTD 4 & 5 EASTHARDING STREET, FETTER LANE E.C.

U of M

"POLYHYMNIA."—From a Life-size Cartoon by Miss Margaret I. Dovaston.

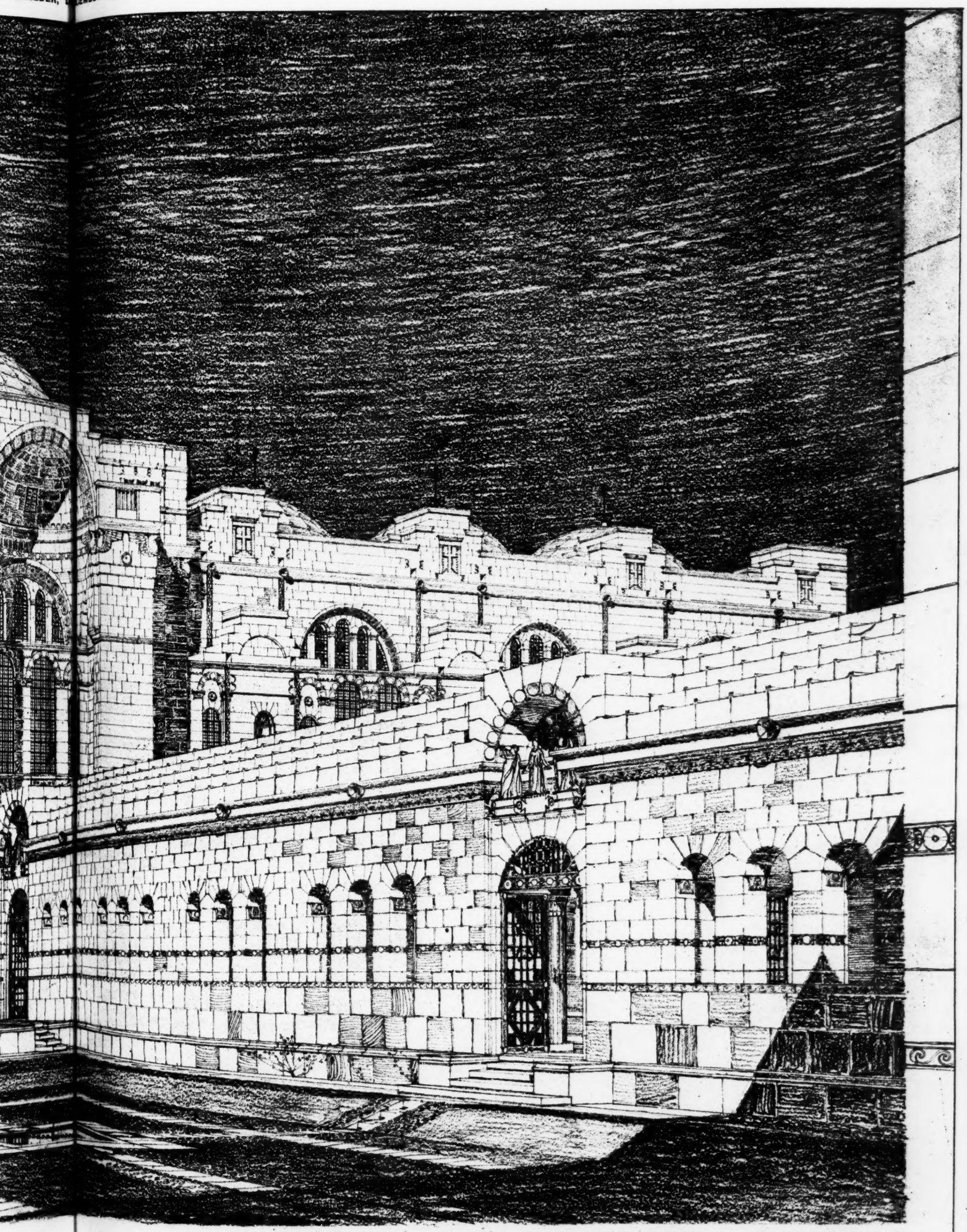
(Royal Academy Silver Medal, 1907.)



A COLLEGE CHAPEL

DESIGN FOR A COLLEGE CHAPEL.—By

(Royal Academy Travelling Studentship, 1907.)

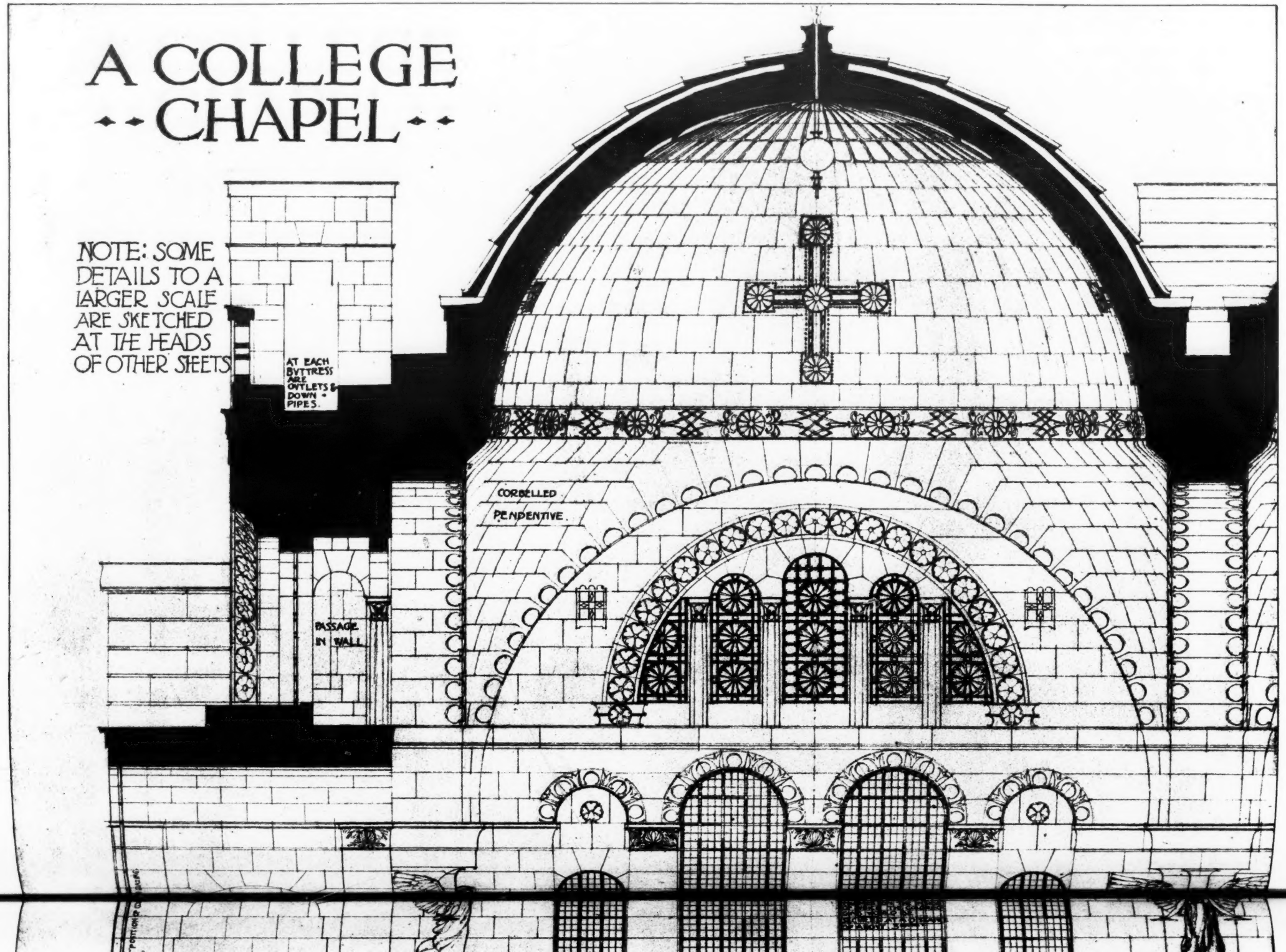


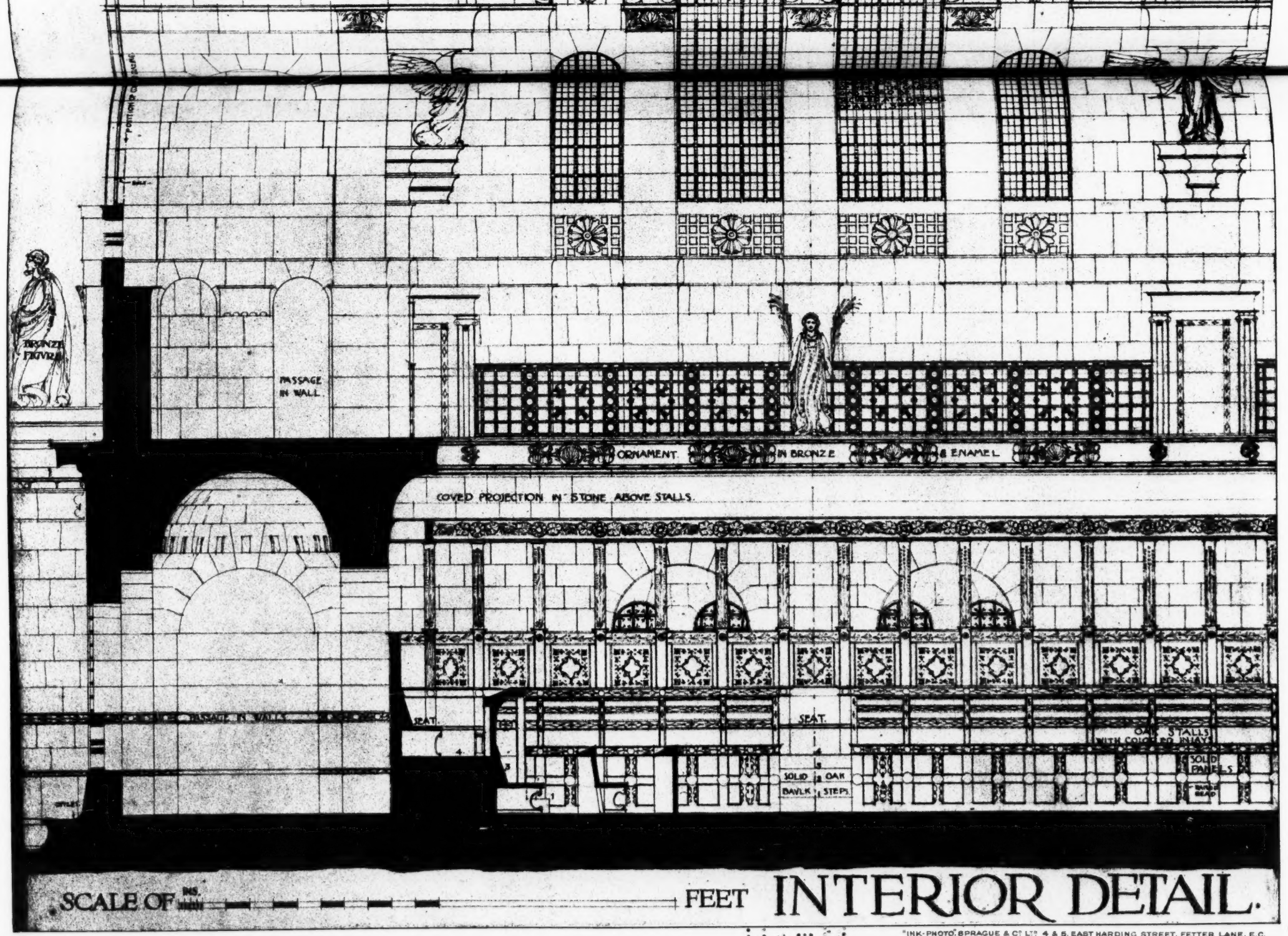
PERSPECTIVE VIEW.

COLLEGE CHAPEL.—By Mr. W. Harvey.

"INK-PHOTO." SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

A COLLEGE CHAPEL


NOTE: SOME DETAILS TO A LARGER SCALE ARE SKETCHED AT THE HEADS OF OTHER SHEETS
AT EACH BUTTRESS ARE OUTLETS & DOWN PIPES.
CORBELLED PENDENTIVE.
PASSAGE IN WALL


BRONZE FIGURE
PASSAGE IN WALL
ORNAMENT IN BRONZE & ENAMEL
COVED PROJECTION IN STONE ABOVE STALLS
SEAT.
SEAT.
SOLID OAK BAULK & STEPS
SOLID PANELS
SCALE OF FEET
INTERIOR DETAIL.
"INK-PHOTO" BRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

DESIGN FOR A COLLEGE CHAPEL.—By Mr. W. Harvey.

(Royal Academy Travelling Studentship, 1907.)